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NEWS 1		Web Page URLs for STN Seminar Schedule - N. America
NEWS 2		"Ask CAS" for self-help around the clock
NEWS 3	Feb 24	PCTGEN now available on STN
NEWS 4	Feb 24	TEMA now available on STN
NEWS 5	Feb 26	NTIS now allows simultaneous left and right truncation
NEWS 6	Feb 26	PCTFULL now contains images
NEWS 7	Mar 04	SDI PACKAGE for monthly delivery of multifile SDI results
NEWS 8	Mar 24	PATDPAFULL now available on STN
NEWS 9	Mar 24	Additional information for trade-named substances without structures available in REGISTRY
NEWS 10	Apr 11	Display formats in DGENE enhanced
NEWS 11	Apr 14	MEDLINE Reload
NEWS 12	Apr 17	Polymer searching in REGISTRY enhanced
NEWS 13	AUG 22	Indexing from 1927 to 1936 added to records in CA/CAPLUS
NEWS 14	Apr 21	New current-awareness alert (SDI) frequency in WPIDS/WPINDEX/WPIX
NEWS 15	Apr 28	RDISCLOSURE now available on STN
NEWS 16	May 05	Pharmacokinetic information and systematic chemical names added to PHAR
NEWS 17	May 15	MEDLINE file segment of TOXCENTER reloaded
NEWS 18	May 15	Supporter information for ENCOMPPAT and ENCOMPLIT updated
NEWS 19	May 19	Simultaneous left and right truncation added to WSCA
NEWS 20	May 19	RAPRA enhanced with new search field, simultaneous left and right truncation
NEWS 21	Jun 06	Simultaneous left and right truncation added to CBNB
NEWS 22	Jun 06	PASCAL enhanced with additional data
NEWS 23	Jun 20	2003 edition of the FSTA Thesaurus is now available
NEWS 24	Jun 25	HSDB has been reloaded
NEWS 25	Jul 16	Data from 1960-1976 added to RDISCLOSURE
NEWS 26	Jul 21	Identification of STN records implemented
NEWS 27	Jul 21	Polymer class term count added to REGISTRY
NEWS 28	Jul 22	INPADOC: Basic index (/BI) enhanced; Simultaneous Left and Right Truncation available
NEWS 29	AUG 05	New pricing for EUROPATFULL and PCTFULL effective August 1, 2003
NEWS 30	AUG 13	Field Availability (/FA) field enhanced in BEILSTEIN
NEWS 31	AUG 15	PATDPAFULL: one FREE connect hour, per account, in September 2003
NEWS 32	AUG 15	PCTGEN: one FREE connect hour, per account, in September 2003
NEWS 33	AUG 15	RDISCLOSURE: one FREE connect hour, per account, in September 2003
NEWS 34	AUG 15	TEMA: one FREE connect hour, per account, in September 2003
NEWS 35	AUG 18	Data available for download as a PDF in RDISCLOSURE
NEWS 36	AUG 18	Simultaneous left and right truncation added to PASCAL
NEWS 37	AUG 18	FROSTI and KOSMET enhanced with Simultaneous Left and Right

```
                  Truncation
NEWS 38  AUG 18  Simultaneous left and right truncation added to ANABSTR

NEWS EXPRESS  April 4 CURRENT WINDOWS VERSION IS V6.01a, CURRENT
              MACINTOSH VERSION IS V6.0b(ENG) AND V6.0Jb(JP),
              AND CURRENT DISCOVER FILE IS DATED 01 APRIL 2003
NEWS HOURS    STN Operating Hours Plus Help Desk Availability
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FILE 'HOME' ENTERED AT 09:27:15 ON 25 AUG 2003

=> file medline
COST IN U.S. DOLLARS                            SINCE FILE      TOTAL
                                                   ENTRY    SESSION
FULL ESTIMATED COST                                 0.21       0.21

FILE 'MEDLINE' ENTERED AT 09:27:28 ON 25 AUG 2003

 FILE LAST UPDATED: 23 AUG 2003 (20030823/UP).  FILE COVERS 1958 TO DATE.

 On April 13, 2003, MEDLINE was reloaded.  See HELP RLOAD for details.

 MEDLINE thesauri in the /CN, /CT, and /MN fields incorporate the
 MeSH 2003 vocabulary.  See http://www.nlm.nih.gov/mesh/changes2003.html
 for a description on changes.

 This file contains CAS Registry Numbers for easy and accurate
 substance identification.

=> e cohen joe d/au
E1            6     COHEN JOANNA E/AU
E2            4     COHEN JOE/AU
E3            0 --> COHEN JOE D/AU
E4            3     COHEN JOEL/AU
E5            1     COHEN JOEL A/AU
E6            3     COHEN JOEL E/AU
E7            1     COHEN JOEL L/AU
E8            1     COHEN JOEL R/AU
E9            3     COHEN JOEL W/AU
E10           2     COHEN JOHN/AU
E11          31     COHEN JON/AU
E12           1     COHEN JON D/AU

=> s e1-e12
              6 "COHEN JOANNA E"/AU
              4 "COHEN JOE"/AU
              0 "COHEN JOE D"/AU
              3 "COHEN JOEL"/AU
              1 "COHEN JOEL A"/AU
```

```
              3 "COHEN JOEL E"/AU
              1 "COHEN JOEL L"/AU
              1 "COHEN JOEL R"/AU
              3 "COHEN JOEL W"/AU
              2 "COHEN JOHN"/AU
             31 "COHEN JON"/AU
              1 "COHEN JON D"/AU
L1           56 ("COHEN JOANNA E"/AU OR "COHEN JOE"/AU OR "COHEN JOE D"/AU OR
                "COHEN JOEL"/AU OR "COHEN JOEL A"/AU OR "COHEN JOEL E"/AU OR
                "COHEN JOEL L"/AU OR "COHEN JOEL R"/AU OR "COHEN JOEL W"/AU OR
                "COHEN JOHN"/AU OR "COHEN JON"/AU OR "COHEN JON D"/AU)

=> dup rem l1
PROCESSING COMPLETED FOR L1
L2            56 DUP REM L1 (0 DUPLICATES REMOVED)

=> e lyon jeffrey/au
E1            1     LYON JAMES G/AU
E2            1     LYON JEFF/AU
E3            0 --> LYON JEFFREY/AU
E4            1     LYON JEFFREY A/AU
E5            2     LYON JENNIFER/AU
E6            1     LYON JESSICA/AU
E7            1     LYON JOSEPH L/AU
E8            1     LYON JOSEPH L JR/AU
E9            1     LYON JOY/AU
E10           7     LYON K/AU
E11           3     LYON K A/AU
E12           3     LYON K E/AU

=> s e1-e9
              1 "LYON JAMES G"/AU
              1 "LYON JEFF"/AU
              0 "LYON JEFFREY"/AU
              1 "LYON JEFFREY A"/AU
              2 "LYON JENNIFER"/AU
              1 "LYON JESSICA"/AU
              1 "LYON JOSEPH L"/AU
              1 "LYON JOSEPH L JR"/AU
              1 "LYON JOY"/AU
L3            9 ("LYON JAMES G"/AU OR "LYON JEFF"/AU OR "LYON JEFFREY"/AU OR
                "LYON JEFFREY A"/AU OR "LYON JENNIFER"/AU OR "LYON JESSICA"/AU
                OR "LYON JOSEPH L"/AU OR "LYON JOSEPH L JR"/AU OR "LYON JOY"/AU)

=> e angov evelina/au
E1            1     ANGOV D/AU
E2            7     ANGOV E/AU
E3            2 --> ANGOV EVELINA/AU
E4            1     ANGOVE ESPY/AU
E5            2     ANGOVE H/AU
E6            3     ANGOVE H C/AU
E7            3     ANGOVE HAYLEY C/AU
E8            4     ANGOVE R/AU
E9            2     ANGOVE R C/AU
E10           1     ANGQUIST K/AU
E11          53     ANGQUIST K A/AU
E12           1     ANGQVIST C A/AU

=> s e1-e9
              1 "ANGOV D"/AU
              7 "ANGOV E"/AU
              2 "ANGOV EVELINA"/AU
              1 "ANGOVE ESPY"/AU
```

```
             2 "ANGOVE H"/AU
             3 "ANGOVE H C"/AU
             3 "ANGOVE HAYLEY C"/AU
             4 "ANGOVE R"/AU
             2 "ANGOVE R C"/AU
L4          25 ("ANGOV D"/AU OR "ANGOV E"/AU OR "ANGOV EVELINA"/AU OR "ANGOVE
                ESPY"/AU OR "ANGOVE H"/AU OR "ANGOVE H C"/AU OR "ANGOVE HAYLEY
                C"/AU OR "ANGOVE R"/AU OR "ANGOVE R C"/AU)

=> e voss gerald/au
E1            5     VOSS G W/AU
E2            1     VOSS GEMMA/AU
E3            1 --> VOSS GERALD/AU
E4            1     VOSS GERRIT/AU
E5            1     VOSS GLENN/AU
E6          182     VOSS H/AU
E7           11     VOSS H E/AU
E8            8     VOSS H F/AU
E9            1     VOSS H G/AU
E10          15     VOSS H J/AU
E11           9     VOSS H L/AU
E12           1     VOSS H M/AU

=> s e1-e5
             5 "VOSS G W"/AU
             1 "VOSS GEMMA"/AU
             1 "VOSS GERALD"/AU
             1 "VOSS GERRIT"/AU
             1 "VOSS GLENN"/AU
L5           9 ("VOSS G W"/AU OR "VOSS GEMMA"/AU OR "VOSS GERALD"/AU OR "VOSS
                GERRIT"/AU OR "VOSS GLENN"/AU)

=> s l1 and (plasmodium falciparum)
         23766 PLASMODIUM
             4 PLASMODIUMS
           771 PLASMODIA
         24162 PLASMODIUM
                 (PLASMODIUM OR PLASMODIUMS OR PLASMODIA)
         16768 FALCIPARUM
         14581 PLASMODIUM FALCIPARUM
                 (PLASMODIUM(W)FALCIPARUM)
L6           2 L1 AND (PLASMODIUM FALCIPARUM)

=> d bib ab 1-2 l6

L6   ANSWER 1 OF 2     MEDLINE on STN
AN   2003221997      MEDLINE
DN   22628579   PubMed ID: 12742586
TI   Development and pre-clinical analysis of a Plasmodium
     falciparum Merozoite Surface Protein-1(42) malaria vaccine.
AU   Angov Evelina; Aufiero Barbara M; Turgeon Ann Marie; Van Handenhove
     Michel; Ockenhouse Christian F; Kester Kent E; Walsh Douglas S; McBride
     Jana S; Dubois Marie-Claude; Cohen Joe; Haynes J David; Eckels
     Kenneth H; Heppner D Gray; Ballou W Ripley; Diggs Carter L; Lyon Jeffrey A
CS   Department of Immunology, WRAIR, 503 Robert Grant Avenue, Silver Spring,
     MD 20910, USA.. Evelina.Angov@na.amedd.army.mil
SO   MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2003 May) 128 (2) 195-204.
     Journal code: 8006324. ISSN: 0166-6851.
CY   Netherlands
DT   Journal; Article; (JOURNAL ARTICLE)
LA   English
FS   Priority Journals
OS   GENBANK-Z35327
```

EM 200308
ED Entered STN: 20030514
Last Updated on STN: 20030802
Entered Medline: 20030801
AB Merozoite Surface Protein-1(42) (MSP-1(42)) is a leading vaccine candidate against erythrocytic malaria parasites. We cloned and expressed **Plasmodium falciparum** MSP-1(42) (3D7 clone) in Escherichia coli. The antigen was purified to greater than 95% homogeneity by using nickel-, Q- and carboxy-methyl (CM)-substituted resins. The final product, designated Falciparum Merozoite Protein-1 (FMP1), had endotoxin levels significantly lower than FDA standards. It was structurally correct based on binding conformation-dependent mAbs, and was stable. Functional antibodies from rabbits vaccinated with FMP1 in Freund's adjuvant inhibited parasite growth in vitro and also inhibited secondary processing of MSP-1(42). FMP1 formulated with GlaxoSmithKline Biologicals (GSK) adjuvant, AS02A or alum was safe and immunogenic in rhesus (Macaca mulatta) monkeys.

L6 ANSWER 2 OF 2 MEDLINE on STN
AN 2003046429 MEDLINE
DN 22443412 PubMed ID: 12556156
TI Protective efficacy of the RTS,S/AS02 **Plasmodium falciparum** malaria vaccine is not strain specific.
AU Alloueche Ali; Milligan Paul; Conway David J; Pinder Margaret; Bojang Kalifa; Doherty Tom; Tornieporth Nadia; **Cohen Joe**; Greenwood Brian M
CS Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, London, United Kingdom.. ali.alloueche@lshtm.ac.uk
SO AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (2003 Jan) 68 (1) 97-101.
Journal code: 0370507. ISSN: 0002-9637.
CY United States
DT (CLINICAL TRIAL)
(CONTROLLED CLINICAL TRIAL)
Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 200302
ED Entered STN: 20030131
Last Updated on STN: 20030204
Entered Medline: 20030203
AB RTS,S/AS02 is a recombinant protein malaria vaccine that contains a large portion of the C-terminal of the circumsporozoite protein (CSP) sequence of the NF54 isolate of **Plasmodium falciparum** fused to the hepatitis B virus surface antigen. It has been shown to induce significant protection to challenge infection with a homologous parasite strain in American volunteers. In a recently completed trial in semi-immune Gambian adults, vaccine efficacy against natural infection was 34% (95% confidence interval = 8-53%, P = 0.014) during the malaria season following vaccination. Breakthrough P. falciparum parasites sampled from vaccinated subjects and from controls were genotyped at two polymorphic regions of the csp gene encoding T cell epitopes (csp-th2r and csp-th3r) to determine if the vaccine conferred a strain-specific effect. The overall distribution of csp allelic variants was similar in infections occurring in vaccine and control groups. Also, the mean number of genotypes per infection in the RTS,S/AS02 group was not reduced compared with the controls.

=> s l2 and (plasmodium falciparum)
L7 56 S L2
23766 PLASMODIUM
4 PLASMODIUMS

```
          771 PLASMODIA
        24162 PLASMODIUM
                (PLASMODIUM OR PLASMODIUMS OR PLASMODIA)
        16768 FALCIPARUM
        14581 PLASMODIUM FALCIPARUM
                (PLASMODIUM(W)FALCIPARUM)
L8          2 L7 AND (PLASMODIUM FALCIPARUM)

=> d bib ab 1-2 l8

L8   ANSWER 1 OF 2     MEDLINE on STN
AN   2003221997     MEDLINE
DN   22628579   PubMed ID: 12742586
TI   Development and pre-clinical analysis of a Plasmodium
     falciparum Merozoite Surface Protein-1(42) malaria vaccine.
AU   Angov Evelina; Aufiero Barbara M; Turgeon Ann Marie; Van Handenhove
     Michel; Ockenhouse Christian F; Kester Kent E; Walsh Douglas S; McBride
     Jana S; Dubois Marie-Claude; Cohen Joe; Haynes J David; Eckels
     Kenneth H; Heppner D Gray; Ballou W Ripley; Diggs Carter L; Lyon Jeffrey A
CS   Department of Immunology, WRAIR, 503 Robert Grant Avenue, Silver Spring,
     MD 20910, USA.. Evelina.Angov@na.amedd.army.mil
SO   MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2003 May) 128 (2) 195-204.
     Journal code: 8006324. ISSN: 0166-6851.
CY   Netherlands
DT   Journal; Article; (JOURNAL ARTICLE)
LA   English
FS   Priority Journals
OS   GENBANK-Z35327
EM   200308
ED   Entered STN: 20030514
     Last Updated on STN: 20030802
     Entered Medline: 20030801
AB   Merozoite Surface Protein-1(42) (MSP-1(42)) is a leading vaccine candidate
     against erythrocytic malaria parasites.  We cloned and expressed
     Plasmodium falciparum MSP-1(42) (3D7 clone) in
     Escherichia coli.  The antigen was purified to greater than 95%
     homogeneity by using nickel-, Q- and carboxy-methyl (CM)-substituted
     resins.  The final product, designated Falciparum Merozoite Protein-1
     (FMP1), had endotoxin levels significantly lower than FDA standards.  It
     was structurally correct based on binding conformation-dependent mAbs, and
     was stable.  Functional antibodies from rabbits vaccinated with FMP1 in
     Freund's adjuvant inhibited parasite growth in vitro and also inhibited
     secondary processing of MSP-1(42).  FMP1 formulated with GlaxoSmithKline
     Biologicals (GSK) adjuvant, AS02A or alum was safe and immunogenic in
     rhesus (Macaca mulatta) monkeys.

L8   ANSWER 2 OF 2     MEDLINE on STN
AN   2003046429     MEDLINE
DN   22443412   PubMed ID: 12556156
TI   Protective efficacy of the RTS,S/AS02 Plasmodium
     falciparum malaria vaccine is not strain specific.
AU   Alloueche Ali; Milligan Paul; Conway David J; Pinder Margaret; Bojang
     Kalifa; Doherty Tom; Tornieporth Nadia; Cohen Joe; Greenwood
     Brian M
CS   Department of Infectious and Tropical Diseases, London School of Hygiene
     and Tropical Medicine, London, United Kingdom.. ali.alloueche@lshtm.ac.uk
SO   AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (2003 Jan) 68 (1)
     97-101.
     Journal code: 0370507. ISSN: 0002-9637.
CY   United States
DT   (CLINICAL TRIAL)
     (CONTROLLED CLINICAL TRIAL)
     Journal; Article; (JOURNAL ARTICLE)
```

LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 200302
ED Entered STN: 20030131
Last Updated on STN: 20030204
Entered Medline: 20030203
AB RTS,S/AS02 is a recombinant protein malaria vaccine that contains a large portion of the C-terminal of the circumsporozoite protein (CSP) sequence of the NF54 isolate of **Plasmodium falciparum** fused to the hepatitis B virus surface antigen. It has been shown to induce significant protection to challenge infection with a homologous parasite strain in American volunteers. In a recently completed trial in semi-immune Gambian adults, vaccine efficacy against natural infection was 34% (95% confidence interval = 8-53%, P = 0.014) during the malaria season following vaccination. Breakthrough P. falciparum parasites sampled from vaccinated subjects and from controls were genotyped at two polymorphic regions of the csp gene encoding T cell epitopes (csp-th2r and csp-th3r) to determine if the vaccine conferred a strain-specific effect. The overall distribution of csp allelic variants was similar in infections occurring in vaccine and control groups. Also, the mean number of genotypes per infection in the RTS,S/AS02 group was not reduced compared with the controls.

=> s l3 and (plasmodium falciparum)
23766 PLASMODIUM
4 PLASMODIUMS
771 PLASMODIA
24162 PLASMODIUM
(PLASMODIUM OR PLASMODIUMS OR PLASMODIA)
16768 FALCIPARUM
14581 PLASMODIUM FALCIPARUM
(PLASMODIUM(W)FALCIPARUM)
L9 1 L3 AND (PLASMODIUM FALCIPARUM)

=> d bib 1 l9

L9 ANSWER 1 OF 1 MEDLINE on STN
AN 2003221997 MEDLINE
DN 22628579 PubMed ID: 12742586
TI Development and pre-clinical analysis of a **Plasmodium falciparum** Merozoite Surface Protein-1(42) malaria vaccine.
AU Angov Evelina; Aufiero Barbara M; Turgeon Ann Marie; Van Handenhove Michel; Ockenhouse Christian F; Kester Kent E; Walsh Douglas S; McBride Jana S; Dubois Marie-Claude; Cohen Joe; Haynes J David; Eckels Kenneth H; Heppner D Gray; Ballou W Ripley; Diggs Carter L; **Lyon Jeffrey A**
CS Department of Immunology, WRAIR, 503 Robert Grant Avenue, Silver Spring, MD 20910, USA.. Evelina.Angov@na.amedd.army.mil
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2003 May) 128 (2) 195-204. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-Z35327
EM 200308
ED Entered STN: 20030514
Last Updated on STN: 20030802
Entered Medline: 20030801

=> s l4 and (plasmodium falciparum)
23766 PLASMODIUM

```
            4 PLASMODIUMS
          771 PLASMODIA
        24162 PLASMODIUM
                (PLASMODIUM OR PLASMODIUMS OR PLASMODIA)
        16768 FALCIPARUM
        14581 PLASMODIUM FALCIPARUM
                (PLASMODIUM(W)FALCIPARUM)
L10         2 L4 AND (PLASMODIUM FALCIPARUM)

=> d bib ab 1-2 l10

L10  ANSWER 1 OF 2     MEDLINE on STN
AN   2003221997     MEDLINE
DN   22628579   PubMed ID: 12742586
TI   Development and pre-clinical analysis of a Plasmodium
     falciparum Merozoite Surface Protein-1(42) malaria vaccine.
AU   Angov Evelina; Aufiero Barbara M; Turgeon Ann Marie; Van
     Handenhove Michel; Ockenhouse Christian F; Kester Kent E; Walsh Douglas S;
     McBride Jana S; Dubois Marie-Claude; Cohen Joe; Haynes J David; Eckels
     Kenneth H; Heppner D Gray; Ballou W Ripley; Diggs Carter L; Lyon Jeffrey A
CS   Department of Immunology, WRAIR, 503 Robert Grant Avenue, Silver Spring,
     MD 20910, USA.. Evelina.Angov@na.amedd.army.mil
SO   MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2003 May) 128 (2) 195-204.
     Journal code: 8006324. ISSN: 0166-6851.
CY   Netherlands
DT   Journal; Article; (JOURNAL ARTICLE)
LA   English
FS   Priority Journals
OS   GENBANK-Z35327
EM   200308
ED   Entered STN: 20030514
     Last Updated on STN: 20030802
     Entered Medline: 20030801
AB   Merozoite Surface Protein-1(42) (MSP-1(42)) is a leading vaccine candidate
     against erythrocytic malaria parasites. We cloned and expressed
     Plasmodium falciparum MSP-1(42) (3D7 clone) in
     Escherichia coli. The antigen was purified to greater than 95%
     homogeneity by using nickel-, Q- and carboxy-methyl (CM)-substituted
     resins. The final product, designated Falciparum Merozoite Protein-1
     (FMP1), had endotoxin levels significantly lower than FDA standards. It
     was structurally correct based on binding conformation-dependent mAbs, and
     was stable. Functional antibodies from rabbits vaccinated with FMP1 in
     Freund's adjuvant inhibited parasite growth in vitro and also inhibited
     secondary processing of MSP-1(42). FMP1 formulated with GlaxoSmithKline
     Biologicals (GSK) adjuvant, AS02A or alum was safe and immunogenic in
     rhesus (Macaca mulatta) monkeys.

L10  ANSWER 2 OF 2     MEDLINE on STN
AN   2001248189     MEDLINE
DN   21189423   PubMed ID: 11292349
TI   Inhibitory and blocking monoclonal antibody epitopes on merozoite surface
     protein 1 of the malaria parasite Plasmodium falciparum
     .
AU   Uthaipibull C; Aufiero B; Syed S E; Hansen B; Guevara Patino J A;
     Angov E; Ling I T; Fegeding K; Morgan W D; Ockenhouse C; Birdsall
     B; Feeney J; Lyon J A; Holder A A
CS   Division of Parasitology, Walter Reed Army Institute of Research,
     Washington, DC, USA.
SO   JOURNAL OF MOLECULAR BIOLOGY, (2001 Apr 13) 307 (5) 1381-94.
     Journal code: 2985088R. ISSN: 0022-2836.
CY   England: United Kingdom
DT   Journal; Article; (JOURNAL ARTICLE)
LA   English
```

FS Priority Journals
OS PDB-1CEJ
EM 200105
ED Entered STN: 20010517
Last Updated on STN: 20010702
Entered Medline: 20010510
AB Merozoite surface protein 1 (MSP-1) is a precursor to major antigens on the surface of Plasmodium spp. merozoites, which are involved in erythrocyte binding and invasion. MSP-1 is initially processed into smaller fragments; and at the time of erythrocyte invasion one of these of 42 kDa (MSP-1(42)) is subjected to a second processing, producing 33 kDa and 19 kDa fragments (MSP-1(33) and MSP-1(19)). Certain MSP-1-specific monoclonal antibodies (mAbs) react with conformational epitopes contained within the two epidermal growth factor domains that comprise MSP-1(19), and are classified as either inhibitory (inhibit processing of MSP-1(42) and erythrocyte invasion), blocking (block the binding and function of the inhibitory mAb), or neutral (neither inhibitory nor blocking). We have mapped the epitopes for inhibitory mAbs 12.8 and 12.10, and blocking mAbs such as 1E1 and 7.5 by using site-directed mutagenesis to change specific amino acid residues in MSP-1(19) and abolish antibody binding, and by using PEPSCAN to measure the reaction of the antibodies with every octapeptide within MSP-1(42). Twenty-six individual amino acid residue changes were made and the effect of each on the binding of mAbs was assessed by Western blotting and BIAcore analysis. Individual changes had either no effect, or reduced, or completely abolished the binding of individual mAbs. No two antibodies had an identical pattern of reactivity with the modified proteins. Using PEPSCAN each mAb reacted with a number of octapeptides, most of which were derived from within the first epidermal growth factor domain, although 1E1 also reacted with peptides spanning the processing site. When the single amino acid changes and the reactive peptides were mapped onto the three-dimensional structure of MSP-1(19), it was apparent that the epitopes for the mAbs could be defined more fully by using a combination of both mutagenesis and PEPSCAN than by either method alone, and differences in the fine specificity of binding for all the different antibodies could be distinguished. The incorporation of several specific amino acid changes enabled the design of proteins that bound inhibitory but not blocking antibodies. These may be suitable for the development of MSP-1-based vaccines against malaria.


```
=> s plasmodium falciparum major surface protein
         23766 PLASMODIUM
             4 PLASMODIUMS
           771 PLASMODIA
         24162 PLASMODIUM
                 (PLASMODIUM OR PLASMODIUMS OR PLASMODIA)
         16768 FALCIPARUM
        447270 MAJOR
           298 MAJORS
        447518 MAJOR
                 (MAJOR OR MAJORS)
        387732 SURFACE
         46663 SURFACES
        412710 SURFACE
                 (SURFACE OR SURFACES)
       1183727 PROTEIN
        992546 PROTEINS
       1524565 PROTEIN
                 (PROTEIN OR PROTEINS)
L11           0 PLASMODIUM FALCIPARUM MAJOR SURFACE PROTEIN
                 (PLASMODIUM(W)FALCIPARUM(W)MAJOR(W)SURFACE(W)PROTEIN)
```

```
=> s plasmodium falciparum
         23766 PLASMODIUM
             4 PLASMODIUMS
           771 PLASMODIA
         24162 PLASMODIUM
                 (PLASMODIUM OR PLASMODIUMS OR PLASMODIA)
         16768 FALCIPARUM
L12      14581 PLASMODIUM FALCIPARUM
                 (PLASMODIUM(W)FALCIPARUM)

=> s l12 and (merozoite surface protein or MSP or MSp1-42)
          1490 MEROZOITE
          1302 MEROZOITES
          2340 MEROZOITE
                 (MEROZOITE OR MEROZOITES)
        387732 SURFACE
         46663 SURFACES
        412710 SURFACE
                 (SURFACE OR SURFACES)
       1183727 PROTEIN
        992546 PROTEINS
       1524565 PROTEIN
                 (PROTEIN OR PROTEINS)
           638 MEROZOITE SURFACE PROTEIN
                 (MEROZOITE(W)SURFACE(W)PROTEIN)
          1345 MSP
            60 MSPS
          1370 MSP
                 (MSP OR MSPS)
           228 MSP1
        144027 42
            14 MSP1-42
                 (MSP1(W)42)
L13         513 L12 AND (MEROZOITE SURFACE PROTEIN OR MSP OR MSP1-42)

=> s l13 and (vaccine)
         77271 VACCINE
         68179 VACCINES
        108478 VACCINE
                 (VACCINE OR VACCINES)
L14         195 L13 AND (VACCINE)

=> s l14 and (3d7)
           126 3D7
L15         13 L14 AND (3D7)

=> dup rem l14
PROCESSING COMPLETED FOR L14
L16         195 DUP REM L14 (0 DUPLICATES REMOVED)

=> dup rem l15
PROCESSING COMPLETED FOR L15
L17          13 DUP REM L15 (0 DUPLICATES REMOVED)

=> d bib ab 1-195 l16

L16  ANSWER 1 OF 195     MEDLINE on STN
AN   2003280879     MEDLINE
DN   22692432   PubMed ID: 12654909
TI   The merozoite surface protein 1 complex of
     human malaria parasite Plasmodium falciparum:
     interactions and arrangements of subunits.
AU   Kauth Christian W; Epp Christian; Bujard Hermann; Lutz Rolf
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CS Zentrum fur Molekulare Biologie der Universitat Heidelberg, Im Neuenheimer Feld 282, D-69120 Heidelberg, Germany.
SO JOURNAL OF BIOLOGICAL CHEMISTRY, (2003 Jun 20) 278 (25) 22257-64. Journal code: 2985121R. ISSN: 0021-9258.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200308
ED Entered STN: 20030617
Last Updated on STN: 20030822
Entered Medline: 20030821
AB The major protein component at the surface of merozoites, the infectious form of blood stage malaria parasites, is the **merozoite surface protein** 1 (**MSP**-1) complex. In the human malaria parasite **Plasmodium falciparum**, this complex is generated by proteolytic cleavage of a 190-kDa glycosylphosphatidylinositol-anchored precursor into four major fragments, which remain non-covalently associated. Here, we describe the in vitro reconstitution of the **MSP**-1 complex of P. falciparum strain 3D7 from its heterologously produced subunits. We provide evidence for the arrangement of the subunits within the complex and show how they interact with each other. Our data indicate that the conformation assumed by the reassembled complex as well as by the heterologously produced 190-kDa precursor corresponds to the native one. Based on these results we propose a first structural model for the **MSP**-1 complex. Together with access to faithfully produced material, this information will advance further structure-function studies of **MSP**-1 that plays an essential role during invasion of erythrocytes by the parasite and that is considered a promising candidate for a malaria **vaccine**.

L16 ANSWER 2 OF 195 MEDLINE on STN
AN 2003252748 MEDLINE
DN 22646091 PubMed ID: 12761133
TI Genetic diversity and antigenic polymorphism in **Plasmodium falciparum**: extensive serological cross-reactivity between allelic variants of **merozoite surface protein** 2.
AU Franks Simon; Baton Luke; Tetteh Kevin; Tongren Eric; Dewin David; Akanmori Bartholomew D; Koram Kojo A; Ranford-Cartwright Lisa; Riley Eleanor M
CS Institute of Cell, Animal and Population Biology, University of Edinburgh, United Kingdom.
SO INFECTION AND IMMUNITY, (2003 Jun) 71 (6) 3485-95. Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200306
ED Entered STN: 20030603
Last Updated on STN: 20030620
Entered Medline: 20030619
AB Diversity in the surface antigens of malaria parasites is generally assumed to be a mechanism for immune evasion, but there is little direct evidence that this leads to evasion of protective immunity. Here we show that alleles of the highly polymorphic **merozoite surface protein** 2 (**MSP**-2) can be grouped (within the known dimorphic families) into distinct serogroups; variants within a serogroup show extensive serological cross-reactivity. Cross-reactive epitopes are immunodominant, and responses to them may be boosted at the expense of responses to novel epitopes (original antigenic sin). The data imply that immune selection explains only some of the diversity in the **msp**

-2 gene and that **MSP**-2 **vaccines** may need to include only a subset of the known variants in order to induce pan-reactive antibodies.

L16 ANSWER 3 OF 195 MEDLINE on STN
AN 2003273522 IN-PROCESS
DN 22684978 PubMed ID: 12798647
TI The protective efficacy of MSP4/5 against lethal Plasmodium chabaudi adami challenge is dependent on the type of DNA **vaccine** vector and vaccination protocol.
AU Rainczuk A; Smooker P M; Kedzierski L; Black C G; Coppel R L; Spithill T W
CS Department of Biochemistry and Molecular Biology, The Cooperative Research Centre for Vaccine Technology, Clayton 3800, Australia.. adam.rainczuk@med.monash.edu.au
SO VACCINE, (2003 Jun 20) 21 (21-22) 3030-42.
Journal code: 8406899. ISSN: 0264-410X.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS IN-PROCESS; NONINDEXED; Priority Journals
ED Entered STN: 20030612
Last Updated on STN: 20030708
AB The enhancement of immunogenicity of malarial DNA **vaccines** is important if they are to have practical application in protecting against blood-stage malaria. Here we describe three different DNA **vaccine** vector types used in conjunction with the blood-stage **merozoite surface protein** 4/5 (MSP4/5), the murine homologue of **Plasmodium falciparum** MSP4 and MSP5, in an attempt to enhance survival against lethal Plasmodium chabaudi adami DS blood-stage challenge. MSP4/5 was inserted into VR1020 (secretory), monocyte-chemotactic protein-3 (MCP-3) (chemoattractant), and cytotoxic T-lymphocyte antigen 4 (CTLA4) (lymph node targeting) vectors. Mice were immunized intradermally via gene-gun, IM injection, or boosting with recombinant MSP4/5 protein. Antibody responses after boosting were predominantly of the IgG1 and IgE isotypes, with low avidity antibodies produced in DNA primed groups. Despite antibody responses comparable to recombinant protein immunization, boosting mice primed with antigens encoded by MCP-3 and CTLA4 vectors did not enhance survival compared to vector control groups. Gene-gun vaccination using VR1020/MSP4/5 followed by recombinant MSP4/5 boosting, or gene-gun DNA vaccination alone using MCP-3/MSP4/5, resulted in enhanced survival compared to empty vector control mice. The results suggest that the enhancement of survival against lethal blood-stage malaria challenge after utilizing MSP4/5 DNA vaccination is therefore highly dependent on the route and type of **vaccine** vector employed.

L16 ANSWER 4 OF 195 MEDLINE on STN
AN 2003188855 IN-PROCESS
DN 22593939 PubMed ID: 12706668
TI Immunization against Plasmodium chabaudi malaria using combined formulations of apical membrane antigen-1 and **merozoite surface protein**-1.
AU Burns James M; Flaherty Patrick R; Romero Margarita M; Weidanz William P
CS Department of Microbiology and Immunology, Drexel University College of Medicine, 2900 Queen Lane, 19129, Philadelphia, PA, USA.
SO VACCINE, (2003 May 16) 21 (17-18) 1843-52.
Journal code: 8406899. ISSN: 0264-410X.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS IN-PROCESS; NONINDEXED; Priority Journals
ED Entered STN: 20030423
Last Updated on STN: 20030423

AB The control of **Plasmodium falciparum** malaria by vaccination will require immunization with multiple parasite antigens effectively formulated in combination. In this regard, proteins expressed on the surface of blood-stage merozoites are attractive as **vaccine** targets given their functional importance in the invasion of erythrocytes and accessibility to serum antibodies. We have utilized a Plasmodium chabaudi **vaccine** model to begin to evaluate the efficacy of immunization with combined formulations of apical membrane antigen-1 (AMA-1) and **merozoite surface protein**-1 (**MSP**-1). Using a pET/T7 RNA polymerase bacterial expression system, we have expressed, purified and refolded recombinant antigens representing the 54kDa ectodomain of Pc AMA-1 and the 42kDa C-terminus of Pc **MSP**-1. Immunization with recombinant Pc AMA-1+Pc **MSP** -1(42) induced a high level of protection against P. chabaudi malaria with protective efficacy varying with antigen dose, choice of adjuvant, and immunization protocol. Based on the reduction of P. chabaudi parasitemia, Alum proved effective for use with the combination of Pc AMA-1 and Pc **MSP**-1(42). The use of Quil A was similarly effective with single or combined antigen immunizations, particularly with low antigen dose. In general, serological analysis of prechallenge sera indicated a dominant IgG1 response. For a given formulation, immunization with the combination of Pc AMA-1 and Pc **MSP**-1(42) elicited IgG responses comparable to those observed following immunization with each antigen alone. However, prechallenge antibody titers alone were not predictive of protective efficacy. While Pc AMA-1 and Pc **MSP**-1(42) can be effectively formulated in combination, further study is needed to define measurable parameters of protective T cell and B cell responses induced by Pc AMA-1+Pc **MSP**-1(42) that are predictive of **vaccine** efficacy.

L16 ANSWER 5 OF 195 MEDLINE on STN
AN 2003150230 MEDLINE
DN 22541511 PubMed ID: 12654798
TI Repeat sequences in block 2 of **Plasmodium falciparum** **merozoite surface protein** 1 are targets of antibodies associated with protection from malaria.
AU Polley Spencer D; Tetteh Kevin K A; Cavanagh David R; Pearce Richard J; Lloyd Jennifer M; Bojang Kalifa A; Okenu Daniel M N; Greenwood Brian M; McBride Jana S; Conway David J
CS London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK.
SO INFECTION AND IMMUNITY, (2003 Apr) 71 (4) 1833-42.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200305
ED Entered STN: 20030402
Last Updated on STN: 20030513
Entered Medline: 20030512
AB Human antibodies to the block 2 region of **Plasmodium falciparum merozoite surface protein** 1 (MSP1) are associated with a reduced prospective risk of clinical malaria. Block 2 is highly polymorphic, but all known alleles can be grouped into three major types. Two of these types (the K1-like and MAD20-like types) contain type-specific sequences (found in all alleles of a particular type) that flank polymorphic tripeptide repeats. These repeats contain both type-specific and subtype-specific sequences. To evaluate the antibody recognition of these parts of block 2, a new panel of six recombinant proteins was used (fused type-specific flanking sequences and two representative repeat sequences for each of the K1-like and MAD20-like types separately). Extensive testing of these antigens and

full-length block 2 antigens showed that human serum immunoglobulin G antibodies induced by infection can recognize (i) type-specific epitopes in the repeats, (ii) subtype-specific epitopes in the repeats, or (iii) type-specific epitopes in flanking sequences. A large prospective study in The Gambia showed that antibodies to the repeats are strongly associated with protection from clinical malaria. The results are important for design of a **vaccine** to induce protective antibodies, and they address hypotheses about repeat sequences in malaria antigens.

L16 ANSWER 6 OF 195 MEDLINE on STN
AN 2003209453 MEDLINE
DN 22616164 PubMed ID: 12729744
TI Crystal structure of a Fab complex formed with PfMSP1-19, the C-terminal fragment of **merozoite surface protein** 1 from **Plasmodium falciparum**: a malaria **vaccine** candidate.
AU Pizarro J C; Chitarra V; Verger D; Holm I; Petres S; Dartevelle S; Nato F; Longacre S; Bentley G A
CS Unite d'Immunologie Structurale (CNRS URA 2185), Departement de Biologie Structurale et Chimie, Institut Pasteur, 25 rue du Dr. Roux, 75724 Paris, cedex 15, France.
SO JOURNAL OF MOLECULAR BIOLOGY, (2003 May 16) 328 (5) 1091-103. Journal code: 2985088R. ISSN: 0022-2836.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200308
ED Entered STN: 20030506
Last Updated on STN: 20030806
Entered Medline: 20030805
AB **Merozoite surface protein** 1 (MSP1) is the major protein component on the surface of the merozoite, the erythrocyte-invasive form of the malaria parasite Plasmodium. Present in all species of Plasmodium, it undergoes two distinct proteolytic maturation steps during the course of merozoite development that are essential for invasion of the erythrocyte. Antibodies specific for the C-terminal maturation product, MSP1-19, can inhibit erythrocyte invasion and parasite growth. This polypeptide is therefore considered to be one of the more promising malaria **vaccine** candidates. We describe here the crystal structure of recombinant MSP1-19 from P.falciparum (PfMSP1-19), the most virulent species of the parasite in humans, as a complex with the Fab fragment of the monoclonal antibody G17.12. This antibody recognises a discontinuous epitope comprising 13 residues on the first epidermal growth factor (EGF)-like domain of PfMSP1-19. Although G17.12 was raised against the recombinant antigen expressed in an insect cell/baculovirus system, it binds uniformly to the surface of merozoites from the late schizont stage, showing that the cognate epitope is exposed on the naturally occurring MSP1 polypeptide complex. Although the epitope includes residues that have been mapped to regions recognised by invasion-inhibiting antibodies studied by other workers, G17.12 does not inhibit erythrocyte invasion or MSP1 processing.

L16 ANSWER 7 OF 195 MEDLINE on STN
AN 2003047677 MEDLINE
DN 22444910 PubMed ID: 12557183
TI Alpha helix shortening in 1522 **MSP**-1 conserved peptide analogs is associated with immunogenicity and protection against P. falciparum malaria.
AU Cubillos Marcia; Espejo Fabiola; Purmova Jindra; Martinez Juan C; Patarroyo M E
CS Fundacion Instituto de Inmunologia de Colombia, Bogota, Colombia.

SO PROTEINS, (2003 Feb 15) 50 (3) 400-9.
Journal code: 8700181. ISSN: 1097-0134.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200302
ED Entered STN: 20030131
Last Updated on STN: 20030222
Entered Medline: 20030221
AB 1522 is a nonimmunogenic conserved high-activity binding peptide (HABP) belonging to **Plasmodium falciparum MSP**-1 protein N-terminal fragment. The key amino acids in binding to red blood cells (RBC) were identified and replaced by others having similar mass but different charge. Because conserved HABPs are not antigenic nor immunogenic, immunogenicity and protectivity studies were then conducted on them in the Aotus monkey. 1H-NMR studies included the lead peptide 1522 as well as the analogs 9782, 13446, 13448, and 13442 to relate their structure to biological function. All the peptides presented alpha-helical structure, with differences observed in helix location and extension. The nonprotective 1522 peptide was totally helical from the N- to the C-terminus, very similar to nonprotective 13442 and 13448 peptides whose extension was almost totally helical. The 9782 and 13446 protective peptides, however, possessed a shorter helical region where modified critical binding residues were not included. A more flexible region was generated at the C-terminus in those peptides with a shorter helical region, leading to a greater number of conformers. These data suggest that peptide flexibility results in increased interaction with immune system molecules, generating protective immunity.

L16 ANSWER 8 OF 195 MEDLINE on STN
AN 2003221997 MEDLINE
DN 22628579 PubMed ID: 12742586
TI Development and pre-clinical analysis of a **Plasmodium falciparum Merozoite Surface Protein** -1(42) malaria **vaccine**.
AU Angov Evelina; Aufiero Barbara M; Turgeon Ann Marie; Van Handenhove Michel; Ockenhouse Christian F; Kester Kent E; Walsh Douglas S; McBride Jana S; Dubois Marie-Claude; Cohen Joe; Haynes J David; Eckels Kenneth H; Heppner D Gray; Ballou W Ripley; Diggs Carter L; Lyon Jeffrey A
CS Department of Immunology, WRAIR, 503 Robert Grant Avenue, Silver Spring, MD 20910, USA.. Evelina.Angov@na.amedd.army.mil
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2003 May) 128 (2) 195-204.
Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-Z35327
EM 200308
ED Entered STN: 20030514
Last Updated on STN: 20030802
Entered Medline: 20030801
AB **Merozoite Surface Protein**-1(42) (**MSP** -1(42)) is a leading **vaccine** candidate against erythrocytic malaria parasites. We cloned and expressed **Plasmodium falciparum MSP**-1(42) (3D7 clone) in Escherichia coli. The antigen was purified to greater than 95% homogeneity by using nickel-, Q- and carboxy-methyl (CM)-substituted resins. The final product, designated Falciparum Merozoite Protein-1 (FMP1), had endotoxin levels significantly lower than FDA standards. It was structurally correct based on binding conformation-dependent mAbs, and was stable. Functional

antibodies from rabbits vaccinated with FMP1 in Freund's adjuvant inhibited parasite growth in vitro and also inhibited secondary processing of **MSP**-1(42). FMP1 formulated with GlaxoSmithKline Biologicals (GSK) adjuvant, AS02A or alum was safe and immunogenic in rhesus (Macaca mulatta) monkeys.

L16 ANSWER 9 OF 195 MEDLINE on STN
AN 2003319757 IN-PROCESS
DN 22733197 PubMed ID: 12849994
TI MHC allele-specific binding of a malaria peptide makes it become promiscuous on fitting a glycine residue into pocket 6.
AU Vargas Luis Eduardo; Parra Carlos Alberto; Salazar Luz Mary; Guzman Fanny; Pinto Martha; Patarroyo Manuel E
CS Fundacion Instituto de Inmunologi;a de Colombia (FIDIC), Carrera 50 No. 26-00. Bogota, Colombia.
SO BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, (2003 Jul 18) 307 (1) 148-56.
Journal code: 0372516. ISSN: 0006-291X.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS IN-PROCESS; NONINDEXED; Priority Journals
ED Entered STN: 20030710
Last Updated on STN: 20030719
AB Peptide 1585 (EVLYLKPLAGVYRSLKKQLE) has a highly conserved amino-acid sequence located in the **Plasmodium falciparum** main **merozoite surface protein** (**MSP**-1) C-terminal region, required for merozoite entry into human erythrocytes and therefore represents a **vaccine** candidate for P. falciparum malaria. Original sequence-specific binding to five HLA DRB1* alleles (0101, 0102, 0401, 0701, and 1101) revealed this peptide's specific HLA DRB1*0102 allele binding. This peptide's allele-specific binding to HLA DRB1*0102 took on broader specificity for the DRB1*0101, -0401, and -1101 alleles when lysine was replaced by glycine in position 17 (peptide 5198: EVLYLKPLAGVYRSLKG(17)QLE). Binding of the identified G(10)VYRSLKGQLE(20) C-terminal register to these alleles suggests that peptide promiscuous binding relied on fitting Y(12), L(15), and G(17) into P-1, P-4, and P-6, respectively. The implications of the findings and the future of this synthetic **vaccine** candidate are discussed.

L16 ANSWER 10 OF 195 MEDLINE on STN
AN 2003222955 MEDLINE
DN 22629328 PubMed ID: 12744528
TI Molecular cloning and sequencing of the merozoite surface antigen 2 gene from **Plasmodium falciparum** strain FCC-1/HN and expression of the gene in mycobacteria.
AU Zheng Chunfu; Xie Peimei; Chen Yatang
CS Institute of Infectious and Parasitic Diseases, The First Affiliated Hospital of Chongqing Medical University, Chongqing 400016, People's Republic of China.. zhengchunfu@hotmail.com
SO JOURNAL OF EUKARYOTIC MICROBIOLOGY, (2003 Mar-Apr) 50 (2) 140-3.
Journal code: 9306405. ISSN: 1066-5234.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF334034
EM 200306
ED Entered STN: 20030515
Last Updated on STN: 20030625
Entered Medline: 20030624
AB Strain bacillus Calmette-Guerin (BCG) of Mycobacterium bovis has been used as a live bacterial **vaccine** to immunize more than 3 billion

people against tuberculosis. In an attempt to use this **vaccine** strain as a vehicle for protective antigens, the gene encoding merozoite surface antigen 2 (MSA2) was amplified from strain FCC-1/HN **Plasmodium falciparum** genome, sequenced, and expressed in M. bovis BCG under the control of an expression cassette carrying the promoter of heat shock protein 70 (HSP70) from Mycobacterium tuberculosis. The recombinant shuttle plasmid pBCG/MSA2 was introduced into mycobacteria by electroporation, and the recombinant mycobacteria harboring pBCG/MSA2 could be induced by heating to express MSA2; the molecular mass of recombinant MSA2 was about 31 kDa. This first report of expression of the full-length P. falciparum MSA2 gene in BCG provides evidence for use of the HSP70 promoter in expressing a foreign gene in BCG and in development of BCG as a multivalent vectoral **vaccine** for malaria.

L16 ANSWER 11 OF 195 MEDLINE on STN
AN 2003028073 MEDLINE
DN 22422812 PubMed ID: 12535387
TI **Vaccines** for preventing malaria.
CM Update of: Cochrane Database Syst Rev. 2000;(2):CD000129
AU Graves P; Gelband H
CS 1400 W. Oak Street, Fort Collins, CO 80521, USA..
patriciagraves@attglobal.net
SO Cochrane Database Syst Rev, (2003) (1) CD000129. Ref: 53
Journal code: 100909747. ISSN: 1469-493X.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
(META-ANALYSIS)
General Review; (REVIEW)
(REVIEW, ACADEMIC)
LA English
FS Priority Journals
EM 200303
ED Entered STN: 20030122
Last Updated on STN: 20030328
Entered Medline: 20030327
AB BACKGROUND: Four types of malaria **vaccine**, SPf66 and **MSP** /RESA **vaccines** (against the asexual stages of the Plasmodium parasite) and CS-NANP and RTS,S **vaccines** (against the sporozoite stages), have been tested in randomized controlled trials in endemic areas. OBJECTIVES: To assess malaria **vaccines** against **Plasmodium falciparum**, P. vivax, P. malariae and P ovale in preventing infection, disease and death. SEARCH STRATEGY: We searched the Cochrane Infectious Diseases Group trials register (July 2002), the Cochrane Controlled Trials Register (The Cochrane Library Issue 2, 2002), MEDLINE (1966 to July 2002), EMBASE (1980 to May 2002), Science Citation Index (1981 to July 2002), and reference lists of articles. We also contacted organizations and researchers in the field. SELECTION CRITERIA: Randomized controlled trials comparing **vaccines** against **Plasmodium falciparum**, P. vivax, P. malariae or P. ovale with placebo or routine antimalarial control measures in people of any age receiving a challenge malaria infection. DATA COLLECTION AND ANALYSIS: Two reviewers independently assessed trial quality and extracted data. MAIN RESULTS: Eighteen efficacy trials involving 10,971 participants were included. There were ten trials of SPf66 **vaccine**, four trials of CS-NANP **vaccines**, two trials of RTS,S **vaccine**, and two of **MSP**/RESA **vaccine**. Results with SPf66 in reducing new malaria infections (P. falciparum) were heterogeneous: it was not effective in four African trials (Peto odds ratio (OR) 0.96, 95% confidence interval (CI) 0.81 to 1.14), but in five trials outside Africa the number of first attacks was reduced (Peto OR 0.77, 95% CI 0.67 to 0.88). Trials to date have not indicated any serious adverse events with SPf66 **vaccine**. In three trials of CS-NANP **vaccines**, there was no evidence for protection by these **vaccines** against

P. falciparum malaria (Peto OR 1.12, 95% CI 0.64 to 1.93). In a small trial in non-immune adults in the USA, RTS,S gave strong protection against experimental infection with P. falciparum. In a trial in an endemic area of the Gambia in semi-immune people, there was a reduction in clinical malaria episodes in the second year of follow up, corresponding to a **vaccine** efficacy of 66% (CI 14% to 85%). In a trial in Papua New Guinea, **MSP**/RESA had no protective effect against episodes of clinical malaria. There was evidence of an effect on parasite density, but this differed according to whether the participants had been pretreated with sulfadoxine/pyrimethamine or not. The prevalence of infections with the parasite subtype of MSP2 in the **vaccine** was reduced compared with the other subtype (Peto OR 0.35, CI 0.23 to 0.53). REVIEWER'S CONCLUSIONS: There is no evidence for protection by SPf66 **vaccines** against P. falciparum in Africa. There is a modest reduction in attacks of P. falciparum malaria following vaccination with SPf66 in other regions. Further research with SPf66 **vaccines** in South America or with new formulations of SPf66 may be justified. There was not enough evidence to evaluate the use of CS-NANP **vaccines**. The RTS,S **vaccine** showed promising result, as did the **MSP**/RESA **vaccine**, but it should include the other main allelic form of MSP2. The **MSP**/RESA trial demonstrated that chemotherapy during a **vaccine** trial may reduce **vaccine** efficacy, and trials should consider very carefully whether this practice is justified.

L16 ANSWER 12 OF 195 MEDLINE on STN
AN 2003156286 IN-PROCESS
DN 22559422 PubMed ID: 12674501
TI **MSP**-1 malaria pseudopeptide analogs: biological and immunological significance and three-dimensional structure.
AU Lozano Jose Manuel; Alba Martha Patricia; Vanegas Magnolia; Silva Yolanda; Torres-Castellanos Jose Libardo; Patarroyo Manuel Elkin
CS Fundacion Instituto de Inmunologia de Colombia, Carrera 50 No. 26-00, Bogota, Colombia.
SO BIOLOGICAL CHEMISTRY, (2003 Jan) 384 (1) 71-82.
Journal code: 9700112. ISSN: 1431-6730.
CY Germany: Germany, Federal Republic of
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS IN-PROCESS; NONINDEXED; Priority Journals
ED Entered STN: 20030404
Last Updated on STN: 20030404
AB **Merozoite Surface Protein**-1 (**MSP**-1) has been considered as a malaria **vaccine** candidate. It is processed during the **Plasmodium falciparum** invasion process of red blood cells (RBCs). A conserved **MSP**-1 C-terminal peptide was identified as a high-activity erythrocyte-binding peptide (HAEBP) termed 1585. Since conserved HAEBPs are neither antigenic nor immunogenic we decided to assess the significance of a single peptide bond replacement in 1585. Thus, two pseudopeptides were obtained by introducing a Y[CH2-NH] reduced amide isoster into the 1585 critical binding motif. The pseudopeptides bound to different HLA-DR alleles, suggesting that backbone modifications affect MHC-II binding patterns. Pseudopeptide-antibodies inhibit in vitro parasite RBC invasion by recognizing **MSP**-1. Each pseudopeptide-induced antibody shows distinct recognition patterns. 1H-NMR studies demonstrated that isoster bonds modulate the pseudopeptides' structure and thus their immunological properties, therefore representing a possible subunit malaria **vaccine** component.

L16 ANSWER 13 OF 195 MEDLINE on STN
AN 2003058679 MEDLINE
DN 22456595 PubMed ID: 12568716

TI Sequence diversity and evolution of the malaria **vaccine** candidate **merozoite surface protein**-1 (**MSP**-1) of **Plasmodium falciparum**.

AU Ferreira Marcelo U; Ribeiro Weber L; Tonon Angela P; Kawamoto Fumihiko; Rich Stephen M

CS Department of Parasitology, Institute for Biomedical Sciences, University of Sao Paulo, Av. Prof. Lineu Prestes 1374, 05508-900, Sao Paulo (SP), Brazil.. muferrei@usp.br

SO GENE, (2003 Jan 30) 304 65-75.
Journal code: 7706761. ISSN: 0378-1119.

CY Netherlands

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

OS GENBANK-AF509630; GENBANK-AF509631; GENBANK-AF509632; GENBANK-AF509633; GENBANK-AF509634; GENBANK-AF509635; GENBANK-AF509636; GENBANK-AF509637; GENBANK-AF509638; GENBANK-AF509639; GENBANK-AF509640; GENBANK-AF509641; GENBANK-AF509642; GENBANK-AF509643; GENBANK-AF509644; GENBANK-AF509645; GENBANK-AF509646; GENBANK-AF509647; GENBANK-AF509648; GENBANK-AF509649; GENBANK-AF509650; GENBANK-AF509651; GENBANK-AF509652; GENBANK-AF509653; GENBANK-AF509654; GENBANK-AF509655; GENBANK-AF509656; GENBANK-AF509657; GENBANK-AF509658; GENBANK-AF509659; GENBANK-AF509660; GENBANK-AF509661; GENBANK-AF509662; GENBANK-AF509663; GENBANK-AF509664; GENBANK-AF509665; GENBANK-AF509666; GENBANK-AF509667; GENBANK-AF509668; GENBANK-AF509669; GENBANK-AF509670; GENBANK-AF509671; GENBANK-AF509672; GENBANK-AF509673; GENBANK-AF509674; GENBANK-AF509675; GENBANK-AF509676; GENBANK-AF509677; GENBANK-AF509678; GENBANK-AF509679; GENBANK-AF509680; GENBANK-AF509681; GENBANK-AF509682; GENBANK-AF509683; GENBANK-AF509684; GENBANK-AF509685; GENBANK-AF509686; GENBANK-AF509687; GENBANK-AF509688; GENBANK-AF509689; GENBANK-AF509690; GENBANK-AF509691; GENBANK-AF509692; GENBANK-AF509693; GENBANK-AF509694; GENBANK-AF509695; GENBANK-AF509696; GENBANK-AF509697; GENBANK-AF509698; GENBANK-AF509699; GENBANK-AF509700; GENBANK-AF509701; GENBANK-AF509702; GENBANK-AF509703; GENBANK-AF509704; GENBANK-AF509705; GENBANK-AF509706; GENBANK-AF509707; GENBANK-AF509708; GENBANK-AF509709; GENBANK-AF509710; GENBANK-AF509711; GENBANK-AF509712; GENBANK-AF509713; GENBANK-AF509714; GENBANK-AF509715; GENBANK-AF509716; GENBANK-AF509717; GENBANK-AF509718; GENBANK-AF509719

EM 200304

ED Entered STN: 20030206
Last Updated on STN: 20030410
Entered Medline: 20030409

AB The **merozoite surface protein**-1 (**MSP** -1) of the malaria parasite **Plasmodium falciparum** is a major blood-stage antigen containing highly polymorphic tripeptide repeats in the domain known as block 2 and several non-repetitive domains that are essentially dimorphic. We have analyzed sequence variation in block 2 repeats and in non-repetitive block 17, as well as other polymorphisms within the **MSP**-1 gene, in clinical isolates of P. falciparum. Repeat haplotypes were defined as unique combinations of repeat motifs within block 2, whereas block 17 haplotypes were defined as unique combinations of single nucleotide replacements in this domain. A new block 17 haplotype, E-TNG-L, was found in one isolate from Vietnam. **MSP**-1 alleles, defined as unique combinations of haplotypes in blocks 2 and 17 and other polymorphisms within the molecule, were characterized in 60 isolates from hypoendemic Brazil and 37 isolates from mesoendemic Vietnam. Extensive diversity has been created in block 2 and elsewhere in the molecule, while maintaining significant linkage disequilibrium between polymorphisms across the non-telomeric **MSP** -1 locus separated by a map distance of more than 4 kb, suggesting that low meiotic recombination rates occur in both parasite populations. These results indicate a role for non-homologous recombination, such as strand-slippage mispairing during mitosis and gene conversion, in creating variation in a malarial antigen under strong diversifying selection.

L16 ANSWER 14 OF 195 MEDLINE on STN
AN 2003137194 IN-PROCESS
DN 22538591 PubMed ID: 12651002
TI Expression and purification of **Plasmodium falciparum** **MSP**-1(42): A malaria **vaccine** candidate.
AU Epp Christian; Kauth Christian W; Bujard Hermann; Lutz Rolf
CS Zentrum fur Molekulare Biologie der Universitat Heidelberg (ZMBH), Im Neuenheimer Feld 282, D-69120, Heidelberg, Germany.
SO J Chromatogr B Analyt Technol Biomed Life Sci, (2003 Mar 25) 786 (1-2) 61-72.
Journal code: 101139554. ISSN: 1570-0232.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS IN-PROCESS; NONINDEXED; Priority Journals
ED Entered STN: 20030325
Last Updated on STN: 20030325
AB The C-terminal 42.10(3) Da portion of the **merozoite** **surface protein** (**MSP**-1) of the human malaria parasite **Plasmodium falciparum** is of interest, not only because it may constitute an essential part of a future anti-malaria **vaccine**, but also due to its role during the infection of erythrocytes by the parasite. We have cloned and expressed two synthetic DNA sequences encoding the two prototypic **MSP**-1(42) variants in E. coli. When over-produced, both proteins form insoluble aggregates which were isolated in high purity and yield. After solubilisation and refolding in vitro, both proteins were purified to homogeneity by a three-step procedure applying Ni-chelate, size exclusion and immuno-affinity chromatography. After purification, both proteins meet key criteria of preparations for clinical use. First, conformational studies suggest proper folding of the proteins, particularly in the region containing two EGF-like domains. Polyclonal serum raised against E. coli produced **MSP**-1(42) recognizes native **MSP**-1 in Plasmodium infected erythrocytes as shown by immunofluorescence.

L16 ANSWER 15 OF 195 MEDLINE on STN
AN 2003217588 MEDLINE
DN 22623791 PubMed ID: 12738356
TI Comparison of analytical methods for the evaluation of antibody responses against epitopes of polymorphic protein antigens.
AU Helg A; Mueller M S; Joss A; Poltl-Frank F; Stuart F; Robinson J A; Pluschke G
CS Swiss Tropical Institute, Socinstrasse 57, CH 4002, Basel, Switzerland.
SO JOURNAL OF IMMUNOLOGICAL METHODS, (2003 May 1) 276 (1-2) 19-31.
Journal code: 1305440. ISSN: 0022-1759.
CY Netherlands
DT (EVALUATION STUDIES)
Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200306
ED Entered STN: 20030513
Last Updated on STN: 20030625
Entered Medline: 20030624
AB Surface exposed protein antigens of the malaria parasite **Plasmodium falciparum** frequently harbor multiple dimorphic amino acid positions. These are associated with parasite immune evasion and represent a major obstacle for subunit **vaccine** design. Here, we have analyzed the flexibility of the humoral immune response against a semiconserved sequence (YX(44)LFX(47)KEKMX(52)L) of the key malaria blood stage **vaccine** candidate **merozoite** **surface protein**-1 (**MSP**-1). Monoclonal

antibodies (mAbs) raised against one of the six described natural sequence variants of **MSP**-1(43-53) were analyzed for cross-reactivity with the other allelic forms, which differ in one to three positions from the immunizing sequence. Enzyme-linked immunosorbent assay (ELISA) and surface plasmon resonance (SPR) spectroscopy demonstrated marked differences in mAb binding avidity to the variant sequences and isothermal titration calorimetry (ITC) provided evidence for a very low affinity of some of the interactions. In immunofluorescence analysis (IFA) and Western blotting analysis, the mAbs nevertheless stained all analyzed parasite clones expressing **MSP**-1(43-53) variant sequences. When used for the evaluation of humoral immune responses in clinical malaria **vaccine** trials, these two commonly used methods may thus not be suitable to distinguish biologically functional high affinity antibody responses from irrelevant low-affinity cross-reactivities.

L16 ANSWER 16 OF 195 MEDLINE on STN
AN 2002678320 MEDLINE
DN 22326341 PubMed ID: 12438375
TI Vaccination of monkeys with recombinant **Plasmodium falciparum** apical membrane antigen 1 confers protection against blood-stage malaria.
AU Stowers Anthony W; Kennedy Michael C; Keegan Brian P; Saul Allan; Long Carole A; Miller Louis H
CS Malaria Vaccine Development Unit, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Rockville, Maryland 20852, USA.. anthony_stowers@csl.com.au
SO INFECTION AND IMMUNITY, (2002 Dec) 70 (12) 6961-7.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200301
ED Entered STN: 20021120
Last Updated on STN: 20030108
Entered Medline: 20030107
AB A major challenge facing malaria **vaccine** development programs is identifying efficacious combinations of antigens. To date, **merozoite surface protein** 1 (MSP1) is regarded as the leading asexual **vaccine** candidate. Apical membrane antigen 1 (AMA1) has been identified as another leading candidate for an asexual malaria **vaccine**, but without any direct in vivo evidence that a recombinant form of **Plasmodium falciparum** AMA1 would have efficacy. We evaluated the efficacy of a form of P. falciparum AMA1, produced in Pichia pastoris, by vaccinating Aotus vociferans monkeys and then challenging them with P. falciparum parasites. Significant protection from this otherwise lethal challenge with P. falciparum was observed. Five of six animals had delayed patency; two of these remained subpatent for the course of the infection, and two controlled parasite growth at <0.75% of red blood cells parasitized. The protection induced by AMA1 was superior to that obtained with a form of MSP1 used in the same trial. The protection induced by a combination **vaccine** of AMA1 and MSP1 was not superior to the protection obtained with AMA1 alone, although the immunity generated appeared to operate against both **vaccine** components.

L16 ANSWER 17 OF 195 MEDLINE on STN
AN 2002426482 MEDLINE
DN 22170791 PubMed ID: 12183594
TI The human immune response to **Plasmodium falciparum** includes both antibodies that inhibit **merozoite surface protein** 1 secondary processing and blocking antibodies.
AU Nwuba Roseangela I; Sodeinde Olugbemiro; Anumudu Chiaka I; Omosun Yusuf O;

Odaibo Alexander B; Holder Anthony A; Nwagwu Mark
CS Cellular Parasitology Programme, Department of Zoology, University of Ibadan, Ibadan, Nigeria.
SO INFECTION AND IMMUNITY, (2002 Sep) 70 (9) 5328-31.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200209
ED Entered STN: 20020817
Last Updated on STN: 20020919
Entered Medline: 20020918
AB Malaria **merozoite surface protein** 1 (MSP1)
is cleaved in an essential step during erythrocyte invasion. The responses of children to natural malaria infection included antibodies that inhibit this cleavage and others that block the binding of these inhibitory antibodies. There was no correlation between the titer of the antibody to the 19-kDa fragment of MSP1 and its inhibitory activity. These findings have implications for the design of MSP1-based **vaccines**.

L16 ANSWER 18 OF 195 MEDLINE on STN
AN 2003010197 MEDLINE
DN 22403654 PubMed ID: 12516559
TI Amino acid dimorphism and parasite immune evasion: cellular immune responses to a promiscuous epitope of **Plasmodium falciparum merozoite surface protein**
1 displaying dimorphic amino acid polymorphism are highly constrained.
AU Daubenberger Claudia A; Nickel Beatrice; Ciatto Carlo; Grutter Markus G; Poltl-Frank Friederike; Rossi Laura; Siegler Uwe; Robinson John; Kashala Oscar; Patarroyo Manuel Elkin; Pluschke Gerd
CS Swiss Tropical Institute, Socinstrasse 57, CH-4002 Basel, Switzerland.. Claudia.Daubenberger@unibas.ch
SO EUROPEAN JOURNAL OF IMMUNOLOGY, (2002 Dec) 32 (12) 3667-77.
Journal code: 1273201. ISSN: 0014-2980.
CY Germany: Germany, Federal Republic of
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200301
ED Entered STN: 20030109
Last Updated on STN: 20030131
Entered Medline: 20030130
AB Like most other surface-exposed antigens of **Plasmodium falciparum**, the leading malaria **vaccine** candidate **merozoite surface protein** (**MSP**)-1
contains a large number of dimorphic amino acid positions. This type of diversity is presumed to be associated with parasite immune evasion and represents one major obstacle to malaria subunit **vaccine** development. To understand the precise role of antigen dimorphism in immune evasion, we have analyzed the flexibility of CD4 T cell immune responses against a semi-conserved sequence stretch of the N-terminal block of **MSP**-1. While this sequence contains overlapping promiscuous T cell epitopes and is a target for growth inhibitory antibodies, three dimorphic amino acid positions may limit its suitability as component of a multi-epitope malaria **vaccine**. We have analyzed the CD4 T cell responses in a group of human volunteers immunized with a synthetic malaria peptide **vaccine** containing a single **MSP**-143-53 sequence variant. All human T cell lines and HLA-DR- or -DP-restricted T cell clones studied were exclusively specific for the sequence variant used for immunization. Competition peptide binding assays with affinity-purified HLA-DR molecules indicated that dimorphism

does not primarily affect HLA binding. Modeling studies of the dominant restricting HLA-DRB1*0801 molecule showed that the dimorphic amino acids represent potential TCR contact residues. Lack of productive triggering of the TCR by MHC/variant peptide ligand complexes thus seems to be the characteristic feature of parasite immune evasion associated with antigen dimorphism.

L16 ANSWER 19 OF 195 MEDLINE on STN
AN 2002338536 MEDLINE
DN 22060663 PubMed ID: 12065487
TI Plasmodium vivax promiscuous T-helper epitopes defined and evaluated as linear peptide chimera immunogens.
AU Caro-Aguilar Ivette; Rodriguez Alexandra; Calvo-Calle J Mauricio; Guzman Fanny; De la Vega Patricia; Patarroyo Manuel Elkin; Galinski Mary R; Moreno Alberto
CS Fundacion Instituto de Inmunologia de Colombia (FIDIC), Santafe de Bogota, Colombia.
NC 5 P51 RR00165-40 (NCRR)
R01 AI24710-15 (NIAID)
SO INFECTION AND IMMUNITY, (2002 Jul) 70 (7) 3479-92.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200207
ED Entered STN: 20020626
Last Updated on STN: 20020731
Entered Medline: 20020730
AB Clinical trials of malaria **vaccines** have confirmed that parasite-derived T-cell epitopes are required to elicit consistent and long-lasting immune responses. We report here the identification and functional characterization of six T-cell epitopes that are present in the **merozoite surface protein**-1 of Plasmodium vivax (PvMSP-1) and bind promiscuously to four different HLA-DRB1* alleles. Each of these peptides induced lymphoproliferative responses in cells from individuals with previous P. vivax infections. Furthermore, linear-peptide chimeras containing the promiscuous PvMSP-1 T-cell epitopes, synthesized in tandem with the **Plasmodium falciparum** immunodominant circumsporozoite protein (CSP) B-cell epitope, induced high specific antibody titers, cytokine production, long-lasting immune responses, and immunoglobulin G isotype class switching in BALB/c mice. A linear-peptide chimera containing an allele-restricted P. falciparum T-cell epitope with the CSP B-cell epitope was not effective. Two out of the six promiscuous T-cell epitopes exhibiting the highest anti-peptide response also contain B-cell epitopes. Antisera generated against these B-cell epitopes recognize P. vivax merozoites in immunofluorescence assays. Importantly, the anti-peptide antibodies generated to the CSP B-cell epitope inhibited the invasion of P. falciparum sporozoites into human hepatocytes. These data and the simplicity of design of the chimeric constructs highlight the potential of multimeric, multistage, and multispecies linear-peptide chimeras containing parasite promiscuous T-cell epitopes for malaria **vaccine** development.

L16 ANSWER 20 OF 195 MEDLINE on STN
AN 2002174778 MEDLINE
DN 21904527 PubMed ID: 11907103
TI **Plasmodium falciparum** variant surface antigen expression varies between isolates causing severe and nonsevere malaria and is modified by acquired immunity.
AU Nielsen Morten A; Staalsoe Trine; Kurtzhals Jorgen A L; Goka Bamenla Q; Dodoo Daniel; Alifrangis Michael; Theander Thor G; Akanmori Bartholomew D;

Hviid Lars
CS Center for Medical Parasitology, Rigshospitalet and University of Copenhagen, Copenhagen, Denmark.. mncmp@rh.dk
SO JOURNAL OF IMMUNOLOGY, (2002 Apr 1) 168 (7) 3444-50.
Journal code: 2985117R. ISSN: 0022-1767.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 200205
ED Entered STN: 20020322
Last Updated on STN: 20020509
Entered Medline: 20020508
AB In areas of endemic parasite transmission, protective immunity to **Plasmodium falciparum** malaria is acquired over several years with numerous disease episodes. Acquisition of Abs to parasite-encoded variant surface Ags (VSA) on the infected erythrocyte membrane is important in the development of immunity, as disease-causing parasites appear to be those not controlled by preexisting VSA-specific Abs. In this work we report that VSA expressed by parasites from young Ghanaian children with P. falciparum malaria were commonly and strongly recognized by plasma Abs from healthy children in the same area, whereas recognition of VSA expressed by parasites from older children was weaker and less frequent. Independent of this, parasites isolated from children with severe malaria (cerebral malaria and severe anemia) were better recognized by VSA-specific plasma Abs than parasites obtained from children with nonsevere disease. This was not due to a higher infection multiplicity in younger patients or in patients with severe disease. Our data suggest that acquisition of VSA-specific Ab responses gradually restricts the VSA repertoire that is compatible with parasite survival in the semi-immune host. This appears to limit the risk of severe disease by discriminating against the expression of VSA likely to cause life-threatening complications, such as cerebral malaria and severe anemia. Such VSA seem to be preferred by parasites infecting a nonimmune host, suggesting that VSA expression and switching are not random, and that the VSA expression pattern is modulated by immunity. This opens the possibility of developing morbidity-reducing **vaccines** targeting a limited subset of common and particularly virulent VSA.

L16 ANSWER 21 OF 195 MEDLINE on STN
AN 2002284762 MEDLINE
DN 22006881 PubMed ID: 12010968
TI Regulation of antigen-specific immunoglobulin G subclasses in response to conserved and polymorphic **Plasmodium falciparum** antigens in an in vitro model.
AU Garraud Olivier; Perraut Ronald; Diouf Ababacar; Nambei Wilfrid S; Tall Adama; Spiegel Andre; Longacre Shirley; Kaslow David C; Jouin Helene; Mattei Denise; Engler Gina M; Nutman Thomas B; Riley Eleanor M; Mercereau-Puijalon Odile
CS Laboratoire d'Immunologie. Laboratoire d'Epidemiologie du Paludisme, Institut Pasteur de Dakar, Dakar, Senegal.. Olivier.Garraud@univ-st-etienne.fr
SO INFECTION AND IMMUNITY, (2002 Jun) 70 (6) 2820-7.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200206
ED Entered STN: 20020528
Last Updated on STN: 20020627
Entered Medline: 20020626
AB Cytophilic antibodies (Abs) play a critical role in protection against

Plasmodium falciparum blood stages, yet little is known about the parameters regulating production of these Abs. We used an in vitro culture system to study the subclass distribution of antigen (Ag)-specific immunoglobulin G (IgG) produced by peripheral blood mononuclear cells (PBMCs) from individuals exposed to P. falciparum or unexposed individuals. PBMCs, cultivated with or without cytokines and exogenous CD40/CD40L signals, were stimulated with a crude parasite extract, recombinant **vaccine** candidates derived from conserved Ags (19-kDa C terminus of **merozoite surface protein** 1 [MSP1(19)], R23, and PfEB200), or recombinant Ags derived from the polymorphic Ags MSP1 block 2 and MSP2. No P. falciparum-specific Ab production was detected in PBMCs from unexposed individuals. PBMCs from donors exposed frequently to P. falciparum infections produced multiple IgG subclasses when they were stimulated with the parasite extract but usually only one IgG subclass when they were stimulated with a recombinant Ag. Optimal Ab production required addition of interleukin-2 (IL-2) and IL-10 for all antigenic preparations. The IgG subclass distribution was both donor and Ag dependent and was only minimally influenced by the exogenous cytokine environment. In vitro IgG production and subclass distribution correlated with plasma Abs to some Ags (MSP1(19), R23, and MSP2) but not others (PfEB200 and the three MSP1 block 2-derived Ags). Data presented here suggest that intrinsic properties of the protein Ag itself play a major role in determining the subclass of the Ab response, which has important implications for rational design of **vaccine** delivery.

L16 ANSWER 22 OF 195 MEDLINE on STN
AN 2002284761 MEDLINE
DN 22006875 PubMed ID: 12010962
TI In vivo expression and immunological studies of the 42-kilodalton carboxyl-terminal processing fragment of **Plasmodium falciparum merozoite surface protein** 1 in the baculovirus-silkworm system.
AU Pang Alan L Y; Hashimoto Caryn N; Tam Leslie Q; Meng Z Q; Hui George S N; Ho Walter K K
CS Department of Biochemistry, Chinese University of Hong Kong, Shatin, Hong Kong.
SO INFECTION AND IMMUNITY, (2002 Jun) 70 (6) 2772-9.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200206
ED Entered STN: 20020528
Last Updated on STN: 20020627
Entered Medline: 20020626
AB The 42-kDa carboxyl-terminal processing fragment of **Plasmodium falciparum merozoite surface protein** 1 (**MSP**-1(42)) is an anti-erythrocytic stage malaria **vaccine** candidate. In this study, **MSP**-1(42) was expressed by using the Bombyx mori nuclear polyhedrosis virus-silkworm expression system, and the antigenicity and immmunogenicity of the recombinant protein, Bmp42, were evaluated. The average yield of Bmp42, as determined by a sandwich enzyme-linked immunosorbent assay (ELISA), was 379 microg/ml of infected silkworm hemolymph, which was >100-fold higher than the level attainable in cell culture medium. N-terminal amino acid sequencing revealed that Bmp42 was correctly processed in silkworm cells. Data from immunoblotting, as well as from the inhibition ELISA, suggested that the conformational B-cell epitopes of **MSP**-1(42) were recreated in Bmp42. Immunization of rabbits with Bmp42 in complete Freund's adjuvant generated high-titer antibody responses against the immunogen. Specificity analyses of the anti-Bmp42 antibodies using

several recombinant **MSP**-1(19) proteins expressing variant and conserved B-cell epitopes suggested that the anti-Bmp42 antibodies recognized primarily conserved epitopes on **MSP**-1(19). Furthermore, the anti-Bmp42 antibodies were highly effective in inhibiting the in vitro growth of parasites carrying homologous or heterologous **MSP**-1(42). Our results demonstrated that the baculovirus-silkworm expression system could be employed to express biologically and immunologically active recombinant **MSP**-1(42) at elevated levels; thus, it is an attractive alternative for producing a protective **MSP**-1(42) **vaccine** for human use.

L16 ANSWER 23 OF 195 MEDLINE on STN
AN 2002164202 MEDLINE
DN 21893116 PubMed ID: 11895968
TI Construction of a tetR-integrated Salmonella enterica serovar Typhi CVD908 strain that tightly controls expression of the major **merozoite surface protein** of **Plasmodium falciparum** for applications in human **Vaccine** production.
AU Qian Feng; Pan Weiqing
CS Department of Etiologic Biology, Second Military Medical University, Shanghai, China.
SO INFECTION AND IMMUNITY, (2002 Apr) 70 (4) 2029-38.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200204
ED Entered STN: 20020317
Last Updated on STN: 20020412
Entered Medline: 20020411
AB Attenuated Salmonella strains are an attractive live vector for delivery of a foreign antigen to the human immune system. However, the problem with this vector lies with plasmid segregation and the low level of expression of the foreign gene in vivo when constitutive expression is employed, leading to a diminished immune response. We have established inducible expressions of foreign genes in the Salmonella enterica serovar Typhi CVD908 **vaccine** strain using the tetracycline response regulatory promoter. To set up this system, a tetracycline repressor (tetR) was integrated into a defined Delta aroC locus of the chromosome via suicide plasmid pJG12/tetR-neo. To remove the neo gene conferring kanamycin resistance from the locus, a cre expression vector under the control of the tetracycline response promoter was transformed into the clone; expression of the Cre recombinase excised the neo gene and generated the end strain CVD908-tetR. Expression of the luciferase reporter gene in this strain is dependent on the presence of tetracycline in the medium and can be regulated up to 4,773-fold. Moreover, the tightly controlled expression of major **merozoite surface protein** 1 (MSP1) and parts of **Plasmodium falciparum** was achieved, and the product yield was increased when the inducible expression system was employed. Inoculation of bacteria harboring plasmid pZE11/**MSP1**(**42**) in mice produced the protein in liver and spleen controlled by the inducer. The persistence of the plasmid-carrying bacteria in mice was determined. Peak colonization of both liver and spleen was detected on the third day postinoculation and was followed by a decline in growth curves. After 14 days postinfection, the majority of the bacteria (>90%) recovered from the liver and spleen of the mice retained the plasmid when expression was induced; this clearly indicated that stability of the expression vector in vivo was improved by inducible expression. Establishment of the regulatory system in the **vaccine** strain may broaden the range of its use by enhancing plasmid stability and expression levels in vivo. Moreover, the availability of the **vaccine** strain inducibly expressing the

entire MSP1 provides possibilities for examining its immunogenicity, particularly the cellular response in animal models.

L16 ANSWER 24 OF 195 MEDLINE on STN
AN 2002124227 MEDLINE
DN 21848607 PubMed ID: 11858878
TI Absence of antigenic competition in Aotus monkeys immunized with **Plasmodium falciparum** DNA **vaccines** delivered as a mixture.
AU Jones Trevor R; Gramzinski Robert A; Aguiar Joao C; Sim B Kim Lee; Narum David L; Fuhrmann Steven R; Kumar Sanjai; Obaldia Nicanor; Hoffman Stephen L
CS Malaria Program, Naval Medical Research Center, 503 Robert Grant Avenue, Silver Spring, MD 20910, USA.. jonest@mmrc.navy.mil
SO VACCINE, (2002 Feb 22) 20 (11-12) 1675-80.
Journal code: 8406899. ISSN: 0264-410X.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200209
ED Entered STN: 20020223
Last Updated on STN: 20020928
Entered Medline: 20020927
AB Aotus lemurinus lemurinus monkeys were immunized four times with one of three DNA plasmids expressing important **Plasmodium falciparum** blood stage **vaccine** candidate proteins or with a mixture containing all three **vaccines**. The three **vaccines** encoded sequences from apical merozoite antigen-1 (AMA-1), erythrocyte binding protein-175 (EBA-175) and **merozoite surface protein**-1 (**MSP**-1). Antigen-specific enzyme-linked immunosorbant assays (ELISAs) showed no significant differences in antibody titer induced to the three antigens by a single **vaccine** compared with the titer induced to that same antigen by the trivalent preparation. Results of immunofluorescent antibody assays against erythrocytes infected with asexual blood stage P. falciparum indicated that each of the three monovalent **vaccines** induced significant antibody responses to whole parasites. The trivalent **vaccine** mixture induced, after four immunizations, an antibody titer to whole parasites that was 3--12-fold higher than those induced by any of the single **vaccines**. The fourth immunization with the trivalent **vaccine** increased the mean antibody in IFAT by more than five-fold.

L16 ANSWER 25 OF 195 MEDLINE on STN
AN 2002125327 MEDLINE
DN 21843133 PubMed ID: 11854228
TI Induction of T helper type 1 and 2 responses to 19-kilodalton **merozoite surface protein** 1 in vaccinated healthy volunteers and adults naturally exposed to malaria.
AU Lee Edwin A M; Palmer Dupeh R; Flanagan Katie L; Reece William H H; Odhiambo Kennedy; Marsh Kevin; Pinder Margaret; Gravenor Michael B; Keitel Wendy A; Kester Kent E; Diggs Carter; Kaslow David; Apostolopoulos V; Ballou W Ripley; Hill Adrian V S; Krzych Urszula; Plebanski Magdalena
CS Molecular Immunology Group, Nuffield Department of Medicine, Institute of Molecular Medicine, John Radcliffe Hospital, University of Oxford, Oxford OX3 9DU, United Kingdom.. elee@enterprise.molbiol.ox.ac.uk
NC NO1-AI-25135 (NIAID)
SO INFECTION AND IMMUNITY, (2002 Mar) 70 (3) 1417-21.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT (CLINICAL TRIAL)
(CLINICAL TRIAL, PHASE I)

Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200204
ED Entered STN: 20020226
Last Updated on STN: 20020403
Entered Medline: 20020401
AB **Plasmodium falciparum** malaria is a major cause of death in the tropics. The 19-kDa subunit of P. falciparum **merozoite surface protein** 1 (**MSP**-1(19)), a major blood stage **vaccine** candidate, is the target of cellular and humoral immune responses in animals and humans. In this phase I trial of **MSP**-1(19), immunization of nonexposed human volunteers with either of the two allelic forms of recombinant **MSP**-1(19) induced high levels of antigen-specific Th1 (gamma interferon) and Th2 (interleukin 4 [IL-4] and IL-10) type lymphokines. The adjustment of the antigen dose and number of immunizations regulated the level of specificity of immune responses and Th1/Th2 bias of responses induced by vaccination. Novel conserved and allelic T-cell epitopes which induced cross-strain immune responses were identified. Importantly, responses to many of these novel epitopes were also present in adults exposed to malaria, both in east (Kenya) and west Africa (The Gambia). These data suggest that epitope-specific naturally acquired **MSP**-1(19) immune responses in endemic populations can be boosted by vaccination.

L16 ANSWER 26 OF 195 MEDLINE on STN
AN 2002217261 MEDLINE
DN 21950941 PubMed ID: 11952894
TI Truncation of **merozoite surface protein** 3 disrupts its trafficking and that of acidic-basic repeat protein to the surface of **Plasmodium falciparum** merozoites.
AU Mills Kerry E; Pearce J Andrew; Crabb Brendan S; Cowman Alan F
CS The Walter and Eliza Hall Institute of Medical Research, Melbourne 3050, Australia.
SO MOLECULAR MICROBIOLOGY, (2002 Mar) 43 (6) 1401-11.
Journal code: 8712028. ISSN: 0950-382X.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200208
ED Entered STN: 20020416
Last Updated on STN: 20020803
Entered Medline: 20020802
AB **Merozoite surface protein** 3 (MSP3), an important **vaccine** candidate, is a soluble polymorphic antigen associated with the surface of **Plasmodium falciparum** merozoites. The MSP3 sequence contains three blocks of heptad repeats that are consistent with the formation of an intramolecular coiled-coil. MSP3 also contains a glutamic acid-rich region and a putative leucine zipper sequence at the C-terminus. We have disrupted the msp3 gene by homologous recombination, resulting in the expression of a truncated form of MSP3 that lacks the putative leucine zipper sequence but retains the glutamic acid-rich region and the heptad repeats. Here, we show that truncated MSP3, lacking the putative leucine zipper region, does not localize to the parasitophorous vacuole or interact with the merozoite surface. Furthermore, the acidic-basic repeat antigen (ABRA), which is present on the merozoite surface, also was not localized to the merozoite surface in parasites expressing the truncated form of MSP3. The P. falciparum merozoites lacking MSP3 and ABRA on the surface show reduced invasion into erythrocytes. These results suggest that MSP3 is not absolutely essential for blood stage growth and that the putative leucine zipper region is required for the trafficking of both MSP3 and ABRA to the

parasitophorous vacuole.

L16 ANSWER 27 OF 195 MEDLINE on STN
AN 2002186324 MEDLINE
DN 21918032 PubMed ID: 11920300
TI A recombinant blood-stage malaria **vaccine** reduces **Plasmodium falciparum** density and exerts selective pressure on parasite populations in a phase 1-2b trial in Papua New Guinea.
AU Genton Blaise; Betuela Inoni; Felger Ingrid; Al-Yaman Fadwa; Anders Robin F; Saul Allan; Rare Lawrence; Baisor Moses; Lorry Kerry; Brown Graham V; Pye David; Irving David O; Smith Thomas A; Beck Hans-Peter; Alpers Michael P
CS Papua New Guinea Institute of Medical Research, Maprik, Papua New Guinea.. Blaise.genton@hospvd.ch
SO JOURNAL OF INFECTIOUS DISEASES, (2002 Mar 15) 185 (6) 820-7. Journal code: 0413675. ISSN: 0022-1899.
CY United States
DT (CLINICAL TRIAL) Journal; Article; (JOURNAL ARTICLE) (RANDOMIZED CONTROLLED TRIAL)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 200204
ED Entered STN: 20020403
Last Updated on STN: 20030105
Entered Medline: 20020411
AB The malaria **vaccine** Combination B comprises recombinant **Plasmodium falciparum** ring-infected erythrocyte surface antigen and 2 **merozoite surface proteins** (MSP1 and MSP2) formulated in oil-based adjuvant. A phase 1-2b double-blind, randomized, placebo-controlled trial in 120 children (5-9 years old) in Papua New Guinea demonstrated a 62% (95% confidence limits: 13%, 84%) reduction in parasite density in children not pretreated with sulfadoxine-pyrimethamine. Vaccinees had a lower prevalence of parasites carrying the MSP2-3D7 allelic form (corresponding to that in the **vaccine**) and a higher incidence of morbid episodes associated with FC27-type parasites. These results demonstrate functional activity of Combination B against P. falciparum in individuals with previous malaria exposure. The specific effects on parasites with particular msp2 genotypes suggest that the MSP2 component, at least in part, accounted for the activity. The **vaccine**-induced selection pressure exerted on the parasites and its consequences for morbidity strongly argue for developing **vaccines** comprising conserved antigens and/or multiple components covering all important allelic types.

L16 ANSWER 28 OF 195 MEDLINE on STN
AN 2002070568 MEDLINE
DN 21655171 PubMed ID: 11796616
TI Protective immune responses to the 42-kilodalton (kDa) region of Plasmodium yoelii **merozoite surface protein** 1 are induced by the C-terminal 19-kDa region but not by the adjacent 33-kDa region.
AU Ahlborg Niklas; Ling Irene T; Howard Wendy; Holder Anthony A; Riley Eleanor M
CS Institute of Cell, Animal and Population Biology, Edinburgh University, Edinburgh EH9 3JT, United Kingdom.
SO INFECTION AND IMMUNITY, (2002 Feb) 70 (2) 820-5. Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals

EM 200202
ED Entered STN: 20020125
Last Updated on STN: 20020222
Entered Medline: 20020221
AB Vaccination of mice with the 42-kDa region of Plasmodium yoelii **merozoite surface protein** 1 (**MSP1**(**42**)) or its 19-kDa C-terminal processing product (MSP1(19)) can elicit protective antibody responses in mice. To investigate if the 33-kDa N-terminal fragment (MSP1(33)) of **MSP1**(**42**) also induces protection, the gene segment encoding MSP1(33) was expressed as a glutathione S-transferase (GST) fusion protein. C57BL/6 and BALB/c mice were immunized with GST-MSP1(33) and subsequently challenged with the lethal P. yoelii YM blood stage parasite. GST-MSP1(33) failed to induce protection, and all mice developed patent parasitemia at a level similar to that in naive or control (GST-immunized) mice; mice immunized with GST-MSP1(19) were protected, as has been shown previously. Specific prechallenge immunoglobulin G (IgG) antibody responses to MSP1 were analyzed by enzyme-linked immunosorbent assay and immunofluorescence. Despite being unprotected, several mice immunized with MSP1(33) had antibody titers (of all IgG subclasses) that were comparable to or higher than those in mice that were protected following immunization with MSP1(19). The finding that P. yoelii MSP1(33) elicits strong but nonprotective antibody responses may have implications for the design of **vaccines** for humans based on **Plasmodium falciparum** or Plasmodium vivax **MSP1**(**42**).

L16 ANSWER 29 OF 195 MEDLINE on STN
AN 2002158137 MEDLINE
DN 21853556 PubMed ID: 11865423
TI **Merozoite surface protein** 3 and protection against malaria in Aotus nancymai monkeys.
AU Hisaeda Hajime; Saul Allan; Reece Joshua J; Kennedy Michael C; Long Carole A; Miller Louis H; Stowers Anthony W
CS Malaria Vaccine Development Unit, Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases/NIH, Rockville, MD 20852, USA.
SO JOURNAL OF INFECTIOUS DISEASES, (2002 Mar 1) 185 (5) 657-64.
Journal code: 0413675. ISSN: 0022-1899.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 200204
ED Entered STN: 20020314
Last Updated on STN: 20030105
Entered Medline: 20020415
AB A blood-stage **vaccine** based on **Plasmodium falciparum merozoite surface protein** 3 (MSP3) was tested for efficacy in a primate model. Aotus nancymai monkeys were vaccinated with yeast-expressed MSP3 before a lethal challenge with **Plasmodium falciparum** parasites. Five of 7 control monkeys had acute infections and required treatment to control parasitemia. Only 1 of 7 monkeys vaccinated with MSP3 required this treatment. The efficacy of the MSP3 vaccination appeared to be comparable to that of **MSP1**(**42**), a leading asexual **vaccine** candidate, in response to which 2 monkeys experienced acute infections. In the MSP3-vaccinated group, protection correlated with prechallenge titers of antibody to MSP3. In the MSP1 and control groups, protection correlated with antibody to MSP3 raised by challenge infection.

L16 ANSWER 30 OF 195 MEDLINE on STN
AN 2002446718 MEDLINE

DN 22189555 PubMed ID: 12201581
TI Polyclonal **Plasmodium falciparum** malaria in travelers and selection of antifolate mutations after proguanil prophylaxis.
AU Farnert Anna; Tengstam Karolin; Palme Ingela Berggren; Bronner Ulf; Lebbad Marianne; Swedberg Gote; Bjorkman Anders
CS Department of Medicine, Karolinska Institutet, Karolinska Hospital, Stockholm, Sweden.. anna.farnert@medks.ki.se
SO AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (2002 May) 66 (5) 487-91.
Journal code: 0370507. ISSN: 0002-9637.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 200210
ED Entered STN: 20020904
Last Updated on STN: 20021004
Entered Medline: 20021003
AB The polymorphism of malaria parasites will greatly influence the efficiency of antimalarial drugs and **vaccines**. This study determined the genetic diversity of **Plasmodium falciparum** infections in 107 travelers and estimated the importance of mutations in the parasite dihydrofolate reductase (dhfr) gene for clinical breakthrough during proguanil prophylaxis. Genotyping with regards to the three highly polymorphic antigen-coding regions (**merozoite surface protein**-1 [**msp**-1], **msp**-2, and the glutamate-rich protein [glurp]) revealed multiple genotypes (up to five) in 64% of the patients. Single genotype infections were mainly associated with prior intake of antimalarial drugs, but also with a shorter stay in a malaria-endemic area and low parasite density. Malaria breakthrough despite proguanil prophylaxis was always associated with mutations in the dhfr gene; always the Asn-108 mutation and often the Ile-51 and Arg-59 mutations. The Leu-164 mutation was found in four travelers from Africa. Travelers with limited time in an endemic area were often infected with polyclonal P. falciparum infections, which suggests that single mosquito inoculations are often composed of several genetically diverse parasites. Chemoprophylaxis reduces the number of infecting clones and selects for resistant parasites as shown for proguanil through mutations in the dhfr gene.

L16 ANSWER 31 OF 195 MEDLINE on STN
AN 2002056949 MEDLINE
DN 21642635 PubMed ID: 11752405
TI A recombinant **vaccine** expressed in the milk of transgenic mice protects Aotus monkeys from a lethal challenge with **Plasmodium falciparum**.
AU Stowers Anthony W; Chen Lh Li-how; Zhang Yanling; Kennedy Michael C; Zou Lanling; Lambert Lynn; Rice Timothy J; Kaslow David C; Saul Allan; Long Carole A; Meade Harry; Miller Louis H
CS Malaria Vaccine Development Unit, Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases, Rockville, MD 20852, USA.. astowers@niaid.nih.gov
SO PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (2002 Jan 8) 99 (1) 339-44.
Journal code: 7505876. ISSN: 0027-8424.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200204
ED Entered STN: 20020125
Last Updated on STN: 20030105
Entered Medline: 20020415

AB Two strains of transgenic mice have been generated that secrete into their milk a malaria **vaccine** candidate, the 42-kDa C-terminal portion of **Plasmodium falciparum merozoite surface protein** 1 (**MSP1(42)**). One strain secretes an **MSP1(42)** with an amino acid sequence homologous to that of the FVO parasite line, the other an **MSP1(42)** where two putative N-linked glycosylation sites in the FVO sequence have been removed. Both forms of **MSP1(42)** were purified from whole milk to greater than 91% homogeneity at high yields. Both proteins are recognized by a panel of monoclonal antibodies and have identical N termini, but are clearly distinguishable by some biochemical properties. These two antigens were each emulsified with Freund's adjuvant and used to vaccinate Aotus nancymai monkeys, before challenge with the homologous P. falciparum FVO parasite line. Vaccination with a positive control molecule, a glycosylated form of **MSP1(42)** produced in the baculovirus expression system, successfully protected five of six monkeys. By contrast, vaccination with the glycosylated version of milk-derived **MSP1(42)** conferred no protection compared with an adjuvant control. Vaccination with the nonglycosylated, milk-derived **MSP1(42)** successfully protected the monkeys, with 4/5 animals able to control an otherwise lethal infection with P. falciparum compared with 1/7 control animals. Analysis of the different **vaccines** used suggested that the differing nature of the glycosylation patterns may have played a critical role in determining efficacy. This study demonstrates the potential for producing efficacious malarial **vaccines** in transgenic animals.

L16 ANSWER 32 OF 195 MEDLINE on STN
AN 2002410763 MEDLINE
DN 22154924 PubMed ID: 12165090
TI Allelic family-specific humoral responses to **merozoite surface protein** 2 (MSP2) in Gabonese residents with **Plasmodium falciparum** infections.
AU Ekala M-T; Jouin H; Lekoulou F; Mercereau-Puijalon O; Ntoumi F
CS Unite de Parasitologie, Centre International de Recherches Medicales, Franceville (CIRMF) Gabon, France.
SO CLINICAL AND EXPERIMENTAL IMMUNOLOGY, (2002 Aug) 129 (2) 326-31. Journal code: 0057202. ISSN: 0009-9104.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200209
ED Entered STN: 20020808
Last Updated on STN: 20020912
Entered Medline: 20020911
AB **Merozoite surface protein** 2 (MSP2) expressed by **Plasmodium falciparum** asexual blood stages has been identified as a promising **vaccine** candidate. In order to explore allelic family-specific humoral responses which may be responsible for parasite neutralization during natural infections, isolates from individuals with either asymptomatic infections or uncomplicated malaria and residing in a Central African area where Plasmodium transmission is high and perennial, were analysed using MSP2 as polymorphic marker. The family-specific antibody responses were assessed by ELISA using MSP2 synthetic peptides. We observed an age-dependence of P. falciparum infection complexity. The decrease of infection complexity around 15 years of age was observed simultaneously with an increase in the mean number of MSP2 variants recognized. No significant difference in the P. falciparum genetic diversity and infection complexity was found in isolates from asymptomatic subjects and patients with uncomplicated malaria. The longitudinal follow-up showed a rapid development of immune

responses to various regions of MSP2 variants within one week. Comparing humoral responses obtained with the other major antigen on the merozoite surface, MSP1, our findings suggest that different pathways of responsiveness are involved in antibody production to merozoite surface antigens.

L16 ANSWER 33 OF 195 MEDLINE on STN
AN 2002293249 MEDLINE
DN 22014239 PubMed ID: 12019444
TI Specific antibodies against recombinant MSP1 of **Plasmodium falciparum** strongly inhibit the parasite growth in vitro.
AU Zhang D M; Pan W Q; Lu D R
CS Department of Etiological Biology of Second Military Medical University, Shanghai 200433, China.. malaria@guomai.sh.cn
SO Sheng Wu Hua Xue Yu Sheng Wu Wu Li Xue Bao (Shanghai), (2002 May) 34 (3) 318-22.
Journal code: 20730160R. ISSN: 0582-9879.
CY China
DT Journal; Article; (JOURNAL ARTICLE)
LA Chinese
FS Priority Journals
EM 200206
ED Entered STN: 20020530
Last Updated on STN: 20020625
Entered Medline: 20020624
AB In order to produce large amounts of protein for **vaccine** trials, a synthetic **msp1-42** gene was inserted into Pichia pastoris expression vector and the plasmid was introduced into Pichia pastoris SMD1168 by electroporation. The expressed **MSP1-42** was secreted into the protein-free medium. To measure the conformational properties of **MSP1-42**,16 monoclonal antibodies (11 recognizing conformational epitopes) were allowed to interact with the Pichia-derived **MSP1-42**, and all antibodies specific for conserved and K1 protype interacted with the protein. Interestingly, three monoclonal antibodies (e.g. 9.8, 13.1 and 7.3), that were shown not to interact with CHO-derived MSP1, could interact with the Pichia-derived **MSP1-42**. Rabbits were immunized with recombinant **MSP1-42** formulated with CFA adjuvant four times. The rabbits were bled on the day 3 after last immunization, and total IgG isolated by protein A column from the immunized rabbits was shown to strongly inhibit the parasite growth in vitro dose-dependently, whereas IgG from rabbit with adjuvant had no inhibition.

L16 ANSWER 34 OF 195 MEDLINE on STN
AN 2002165905 MEDLINE
DN 21896228 PubMed ID: 11897136
TI Limited polymorphism of the **vaccine** candidate **merozoite surface protein** 4 of **Plasmodium falciparum**.
AU Wang Lina; Marshall Vikki M; Coppel Ross L
CS Department of Microbiology, Monash University, Clayton, Victoria 3800, Australia.
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2002 Apr 9) 120 (2) 301-3.
Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF295305; GENBANK-AF295306; GENBANK-AF295307; GENBANK-AF295308; GENBANK-AF295309; GENBANK-AF295310; GENBANK-AF295311; GENBANK-AF295312; GENBANK-AF295313; GENBANK-AF295314; GENBANK-AF295315; GENBANK-AF295316; GENBANK-AF295317; GENBANK-AF295318; GENBANK-AF295319; GENBANK-AF295320;

GENBANK-AF295321; GENBANK-AF295322; GENBANK-AF295323; GENBANK-AF295324
EM 200206
ED Entered STN: 20020319
Last Updated on STN: 20020615
Entered Medline: 20020614

L16 ANSWER 35 OF 195 MEDLINE on STN
AN 2002165896 MEDLINE
DN 21896219 PubMed ID: 11897127
TI The Plasmodium vivax homologues of **merozoite surface proteins** 4 and 5 from **Plasmodium falciparum** are expressed at different locations in the merozoite.
AU Black Casilda G; Barnwell John W; Huber Curtis S; Galinski Mary R; Coppel Ross L
CS Department of Microbiology, Monash University, PO Box 53, Calyton 3800 Victoria, Australia.
NC R01 AI 24710-15 (NIAID)
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2002 Apr 9) 120 (2) 215-24. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF403475; GENBANK-AF403476; GENBANK-AF420240; GENBANK-AF420241
EM 200206
ED Entered STN: 20020319
Last Updated on STN: 20020615
Entered Medline: 20020614
AB **Merozoite surface proteins** of **Plasmodium falciparum** are one major group of antigens currently being investigated and tested as malaria **vaccine** candidates. Two recently described P. falciparum merozoite surface antigens, MSP4 and MSP5, are GPI-anchored proteins that each contain a single EGF-like domain and appear to have arisen by an ancient gene duplication event. The genes are found in tandem on chromosome 2 of P. falciparum and the syntenic region of the genome was identified in the rodent malarias P. chabaudi, P. yoelii and P. berghei. In these species, there is only a single gene, designated MSP4/5 encoding a single EGF-like domain similar to the EGF-like domain in both PfMSP4 and PfMSP5. Immunization of mice with PyMSP4/5 provides mice with high levels of protection against lethal challenge with blood stage P. yoelii. In this study, we show that in P. vivax, which is quite phylogenetically distant from P. falciparum, both MSP4 and MSP5 homologues can be found with their relative arrangements with respect to the surrounding genes mostly preserved. However, the gene for MSP2, found between MSP5 and adenylosuccinate lyase (ASL) in P. falciparum, is absent from P. vivax. The PvMSP4 and PvMSP5 genes have a two-exon structure and encode proteins with potential signal and GPI anchor sequences and a single EGF-like domain near the carboxyl-terminus. Rabbit antisera raised against purified recombinant proteins show that each of the antisera react with distinct proteins of 62 kDa for PvMSP4 and 86 kDa for PvMSP5 in parasite lysates. Indirect immunofluorescence assays (IFA) localized PvMSP4 over the entire surface of P. vivax merozoites, as expected, whereas, the MSP5 homologue was found to be associated with an apical organellar location consistent with micronemes or over the polar prominence.

L16 ANSWER 36 OF 195 MEDLINE on STN
AN 2002217449 MEDLINE
DN 21951206 PubMed ID: 11953161
TI Synthesis and expression of 42 kD C-terminal region of the major **merozoite surface protein (MSP1 - 42)** of P. falciparum 3D7 strain in pichia pastoris.
AU Zhang Dongmei; Pan Weiqing; Lu Deru; Jiang Liping

CS Institute of Medical Biotechnology & Molecular Genetics of Second Military Medical University, Shanghai 200433 China.
SO CHUNG-HUA I HSUEH TSA CHIH [CHINESE MEDICAL JOURNAL], (2002 Feb 10) 82 (3) 198-202.
Journal code: 7511141. ISSN: 0376-2491.
CY China
DT Journal; Article; (JOURNAL ARTICLE)
LA Chinese
FS Priority Journals
EM 200207
ED Entered STN: 20020416
Last Updated on STN: 20020703
Entered Medline: 20020702
AB OBJECTIVE: Production of 3D7/**MSP1 - 42** recombinant protein with correct conformation in Pichia pastoris for **vaccine** efficiency assay. METHODS: Asymmetric PCR-based method was utilized to synthesize the 1 202 bp 3D7/**msp1 - 42** gene. The expressing plasmid containing the synthetic gene was introduced into Pichia pastoris by electroporation. The secreted product was detected by Western Blot. RESULTS: The redesigned entire 3D7/**msp1 - 42** gene was generated with error-free, and expressed to produce 42 kD recombinant protein in secreted form. Conformational monoclonal antibody specific for MSP1 C-terminal can interact with the recombinant protein. CONCLUSION: The redesigned 3D7/**msp1 - 42** gene was expressed in P. pastoris with full length of recombinant protein which resembled most likely to the native protein.

L16 ANSWER 37 OF 195 MEDLINE on STN
AN 2002706955 MEDLINE
DN 22356753 PubMed ID: 12467983
TI Evidence for intragenic recombination in **Plasmodium falciparum**: identification of a novel allele family in block 2 of **merozoite surface protein**-1: Asembo Bay Area Cohort Project XIV.
AU Takala Shannon; Branch OraLee; Escalante Ananias A; Kariuki Simon; Wootton John; Lal Altaf A
CS Molecular Vaccine Section, Division of Parasitic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Mail Stop-F12, 4770 Buford Hwy., Atlanta, GA 30341, USA.
NC R01 GM60740 (NIGMS)
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2002 Nov-Dec) 125 (1-2) 163-71.
Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200303
ED Entered STN: 20021217
Last Updated on STN: 20030401
Entered Medline: 20030331
AB We have investigated intragenic recombination in Block 2 of the **merozoite surface protein**-1 (**MSP**-1), where three allele-specific families: K1, Mad20, and RO33 were previously known. Using parasites from western Kenya, we have found a fourth Block 2 allele type, which is a recombinant between Mad20 and RO33 alleles. These recombinant alleles, which we have termed MR, contain sequence from the 5' region of Mad20 and the 3' region of RO33. The results of this study provide new data on the complexity of the **MSP**-1 antigen gene, which is a candidate **vaccine** antigen, and further support the importance of intragenic recombination in generating genetic variability in **Plasmodium falciparum** parasites in nature.

L16 ANSWER 38 OF 195 MEDLINE on STN

AN 2002610078 MEDLINE
DN 22251358 PubMed ID: 12364790
TI The **Plasmodium falciparum** genome--a blueprint for erythrocyte invasion.
AU Cowman Alan F; Crabb Brendan S
CS Walter and Eliza Hall Institute of Medical Research, PO Royal Melbourne Hospital, Melbourne, Victoria 3050, Australia.. cowman@wehi.edu.au
SO SCIENCE, (2002 Oct 4) 298 (5591) 126-8.
Journal code: 0404511. ISSN: 1095-9203.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200210
ED Entered STN: 20021008
Last Updated on STN: 20021023
Entered Medline: 20021022
AB Erythrocyte invasion by **Plasmodium falciparum** involves multiple ligand-receptor interactions and numerous apparent redundancies. The genome sequence of this parasite reveals new gene families encoding proteins that appear to mediate erythrocyte invasion.

L16 ANSWER 39 OF 195 MEDLINE on STN
AN 2002117685 MEDLINE
DN 21839608 PubMed ID: 11849704
TI **Merozoite surface protein**-9 of Plasmodium vivax and related simian malaria parasites is orthologous to p101/ABRA of P. falciparum.
AU Vargas-Serrato Esmeralda; Barnwell John W; Ingravallo Paul; Perler Francine B; Galinski Mary R
CS Department of Medicine, Emory Vaccine Research Center, Yerkes Primate Research Center, Emory University, 954 Gatewood Rd., Atlanta, GA 30329, USA.
NC AI24710-15 (NIAID)
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2002 Mar) 120 (1) 41-52.
Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF435853; GENBANK-AF435854; GENBANK-AF435855
EM 200205
ED Entered STN: 20020220
Last Updated on STN: 20020602
Entered Medline: 20020531
AB Plasmodium vivax **merozoite surface protein**-9 (Pvmsp-9) is characterized here along with orthologues from the related simian malarias Plasmodium cynomolgi and Plasmodium knowlesi. We show that although the corresponding **MSP**-9 proteins do not have acidic-basic repeated amino acid (aa) motifs, they are related to the **Plasmodium falciparum** acidic-basic repeat antigen (ABRA) also known as p101. Recognition of this new interspecies Plasmodium **MSP** family stems from the prior identification of related **MSP** termed PvMSP-185, PcyMSP-150, and PkMSP-110 on the surface of P. vivax, P. cynomolgi and P. knowlesi merozoites. A clone containing the nearly complete P. knowlesi gene encoding PkMSP-110/**MSP**-9 provided a hybridization probe and initial sequence information for the design of primers to obtain the P. vivax and P. cynomolgi orthologues using polymerase chain reaction (PCR) amplification strategies. The P. vivax, P. cynomolgi and P. knowlesi **msp**-9 genes encode proteins that range in calculated molecular mass from 80 to 107 kDa, have typical eukaryotic signal peptides and diverse repeated motifs present immediately upstream of their termination codon. Another feature conserved among

these proteins, including the P. falciparum ABRA protein, is the positions of four cysteine residues near the N-terminus, suggesting this conservation maintains structural and perhaps functional characteristics in the **MSP**-9 family. Rabbit polyclonal antisera raised against recombinantly expressed N-termini of P. knowlesi and P. vivax **MSP** -9 cross-react with the counterpart proteins in immunofluorescence and immunoblot assays. Comparative interspecies investigations of the potential role(s) of Plasmodium **MSP**-9 in merozoite invasion of erythrocytes and as a malaria **vaccine** candidate can now be pursued.

L16 ANSWER 40 OF 195 MEDLINE on STN
AN 2002291218 MEDLINE
DN 22027141 PubMed ID: 12031287
TI NMR structure of **Plasmodium falciparum** malaria peptide correlates with protective immunity.
AU Purmova Jindra; Salazar Luz Mary; Espejo Fabiola; Torres Mary Helena; Cubillos Marcia; Torres Elizabeth; Lopez Yolanda; Rodriguez Raul; Patarroyo Manuel Elkin
CS Fundacion Instituto de Inmunologia de Colombia (FIDIC), Bogota, Colombia.
SO BIOCHIMICA ET BIOPHYSICA ACTA, (2002 May 10) 1571 (1) 27-33. Journal code: 0217513. ISSN: 0006-3002.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200208
ED Entered STN: 20020529
Last Updated on STN: 20020821
Entered Medline: 20020820
AB Apical membrane antigen-1 is an integral **Plasmodium falciparum** malaria parasite membrane protein. High activity binding peptides (HABPs) to human red blood cells (RBCs) have been identified in this protein. One of them (peptide 4313), for which critical binding residues have already been defined, is conserved and nonimmunogenic. Its critical binding residues were changed for amino acids having similar mass but different charge to change such immunological properties; these changes generated peptide analogues. Some of these peptide analogues became immunogenic and protective in Aotus monkeys.Three-dimensional models of peptide 4313 and three analogues having different immune characteristics, were calculated from nuclear magnetic resonance (NMR) experiments with distance geometry and restrained molecular dynamic methods. All peptides contained a beta-turn structure spanning amino acids 7 to 10, except randomly structured 4313. When analysing dihedral angle phi and psi values, distorted type III or III' turns were identified in the protective and/or immunogenic peptides, whilst classical type III turns were found for the nonimmunogenic nonprotective peptides. This data shows that some structural modifications may lead to induction of immunogenicity and/or protection, suggesting a new way to develop multicomponent, subunit-based malarial **vaccines**.

L16 ANSWER 41 OF 195 MEDLINE on STN
AN 2002140845 MEDLINE
DN 21830646 PubMed ID: 11841841
TI A DNA **vaccine** encoding the 42 kDa C-terminus of **merozoite surface protein** 1 of **Plasmodium falciparum** induces antibody, interferon-gamma and cytotoxic T cell responses in rhesus monkeys: immuno-stimulatory effects of granulocyte macrophage-colony stimulating factor.
AU Kumar Sanjai; Villinger Francois; Oakley Miranda; Aguiar Joao C; Jones Trevor R; Hedstrom Richard C; Gowda Kalpana; Chute John; Stowers Anthony; Kaslow David C; Thomas Elaine K; Tine John; Klinman Dennis; Hoffman

Stephen L; Weiss Walter W
CS Malaria Program, Naval Medical Research Center, Silver Spring, MD 20910, USA.. kumars@nmrc.navy.mil
SO IMMUNOLOGY LETTERS, (2002 Apr 1) 81 (1) 13-24.
Journal code: 7910006. ISSN: 0165-2478.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200208
ED Entered STN: 20020307
Last Updated on STN: 20020807
Entered Medline: 20020806
AB We have constructed a DNA plasmid **vaccine** encoding the C-terminal 42-kDa region of the **merozoite surface protein** 1 (pMSP1(42)) from the 3D7 strain of **Plasmodium falciparum** (Pf3D7). This plasmid expressed recombinant **MSP1(42)** after in vitro transfection in mouse VM92 cells. Rhesus monkeys immunized with pMSP1(42) produced antibodies reactive with Pf3D7 infected erythrocytes by IFAT, and by ELISA against yeast produced MSP1(19) (yMSP1(19)). Immunization also induced antigen specific T cell responses as measured by interferon-gamma production, and by classical CTL chromium release assays. In addition, immunization with pMSP1(42) primed animals for an enhanced antibody response to a subsequent boost with the recombinant yMSP1(19). We also evaluated Granulocyte-Macrophage Colony-Stimulating Factor (GM-CSF) as an adjuvant for pMSP1(42.) We tested both rhesus GM-CSF expressed from a DNA plasmid, and E. coli produced recombinant human GM-CSF. Plasmids encoding rhesus GM-CSF (prhGM-CSF) and human GM-CSF (phuGM-CSF) were constructed; these plasmids expressed bio-active recombinant GMCSF. Co-immunization with a mixture of prhGM-CSF and pMSP1(42) induced higher specific antibody responses after the first dose of plasmid, but after three doses of DNA monkeys immunized with or without prhGM-CSF had the same final antibody titers and T cell responses. In comparison, rhuGM-CSF protein did not lead to accelerated antibody production after the first DNA dose. However, antibody titers were maintained at a slightly higher level in monkeys receiving GM-CSF protein, and they had a higher response to boosting with recombinant MSP1(19). The GM-CSF plasmid or protein appears to be less potent as an adjuvant in rhesus monkeys than each is in mice, and more work is needed to determine if GM-CSF can be a useful adjuvant in DNA vaccination of primates.

L16 ANSWER 42 OF 195 MEDLINE on STN
AN 2001349835 MEDLINE
DN 21306184 PubMed ID: 11413200
TI A robust neutralization test for **Plasmodium falciparum** malaria.
CM Comment on: J Exp Med. 2001 Jun 18;193(12):1403-12
AU Saul A; Miller L H
CS Malaria Vaccine Development Unit, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Rockville, Maryland 20852, USA.. ASaul@niaid.nih.gov
SO JOURNAL OF EXPERIMENTAL MEDICINE, (2001 Jun 18) 193 (12) F51-4.
Journal code: 2985109R. ISSN: 0022-1007.
CY United States
DT Commentary
Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200108
ED Entered STN: 20010813
Last Updated on STN: 20010813
Entered Medline: 20010809

L16 ANSWER 43 OF 195 MEDLINE on STN
AN 2001674211 MEDLINE
DN 21562576 PubMed ID: 11705894
TI Codon optimization of gene fragments encoding **Plasmodium falciparum** merzoite proteins enhances DNA **vaccine** protein expression and immunogenicity in mice.
AU Narum D L; Kumar S; Rogers W O; Fuhrmann S R; Liang H; Oakley M; Taye A; Sim B K; Hoffman S L
CS EntreMed, Inc., Rockville, Maryland, USA.
NC AI36758-02 (NIAID)
SO INFECTION AND IMMUNITY, (2001 Dec) 69 (12) 7250-3.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200112
ED Entered STN: 20011127
Last Updated on STN: 20020123
Entered Medline: 20011212
AB In contrast to conventional **vaccines**, DNA and other subunit **vaccines** exclusively utilize host cell molecules for transcription and translation of proteins. The adenine plus thymine content of **Plasmodium falciparum** gene sequences (approximately 80%) is much greater than that of Homo sapiens (approximately 59%); consequently, codon usage is markedly different. We hypothesized that modifying codon usage of P. falciparum genes encoded by DNA **vaccines** from that used by the parasite to those resembling mammalian codon usage would lead to increased P. falciparum protein expression in vitro in mouse cells and increased antibody responses in DNA-vaccinated mice. We synthesized gene fragments encoding the receptor-binding domain of the 175-kDa P. falciparum erythrocyte-binding protein (EBA-175 region II) and the 42-kDa C-terminal processed fragment of the P. falciparum **merozoite surface protein** 1 (**MSP**-1(42)) using the most frequently occurring codon in mammals to code for each amino acid, and inserted the synthetic genes in DNA **vaccine** plasmids. In in vitro transient-expression assays, plasmids containing codon-optimized synthetic gene fragments (pS plasmids) showed greater than fourfold increased protein expression in mouse cells compared to those containing native gene fragments (pN plasmids). In mice immunized with 0.5, 5.0, or 50 microg of the DNA plasmids, the dose of DNA required to induce equivalent antibody titers was 10- to 100-fold lower for pS than for pN plasmids. These data demonstrate that optimizing codon usage in DNA **vaccines** can improve protein expression and consequently the immunogenicity of gene fragments in DNA **vaccines** for organisms whose codon usage differs substantially from that of mammals.

L16 ANSWER 44 OF 195 MEDLINE on STN
AN 2001392795 MEDLINE
DN 21340373 PubMed ID: 11447164
TI Immunogenicity of well-characterized synthetic **Plasmodium falciparum** multiple antigen peptide conjugates.
AU Joshi M B; Gam A A; Boykins R A; Kumar S; Sacci J; Hoffman S L; Nakhasi H L; Kenney R T
CS Laboratory of Parasitic Biology and Biochemistry, Office of Vaccine Research and Review, Maryland, USA.
SO INFECTION AND IMMUNITY, (2001 Aug) 69 (8) 4884-90.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English

FS Priority Journals
EM 200108
ED Entered STN: 20010827
Last Updated on STN: 20010827
Entered Medline: 20010823
AB Given the emerging difficulties with malaria drug resistance and vector control, as well as the persistent lack of an effective **vaccine**, new malaria **vaccine** development strategies are needed. We used a novel methodology to synthesize and fully characterize multiple antigen peptide (MAP) conjugates containing protective epitopes from **Plasmodium falciparum** and evaluated their immunogenicity in four different strains of mice. A di-epitope MAP (T3-T1) containing two T-cell epitopes of liver stage antigen-1 (LSA-1), a di-epitope MAP containing T-cell epitopes from LSA-1 and from **merozoite surface protein**-1, and a tri-epitope MAP (T3-CS-T1) containing T3-T1 and a potent B-cell epitope from the circumsporozoite protein central repeat region were tested in this study. Mice of all four strains produced peptide-specific antibodies; however, the magnitude of the humoral response indicated strong genetic restriction between the different strains of mice. Anti-MAP antibodies recognized stage-specific proteins on the malaria parasites in an immunofluorescence assay. In addition, serum from hybrid BALB/cJ x A/J CAF1 mice that had been immunized with the tri-epitope MAP T3-CS-T1 successfully inhibited the malaria sporozoite invasion of hepatoma cells in vitro. Spleen cells from immunized mice also showed a genetically restricted cellular immune response when stimulated with the immunogen in vitro. This study indicates that well-characterized MAPs combining solid-phase synthesis and conjugation chemistries are potent immunogens and that this approach can be utilized for the development of subunit **vaccines**.

L16 ANSWER 45 OF 195 MEDLINE on STN
AN 2001334124 MEDLINE
DN 21295089 PubMed ID: 11401978
TI Naturally acquired antibody responses to **Plasmodium falciparum merozoite surface protein** 4 in a population living in an area of endemicity in Vietnam.
AU Wang L; Richie T L; Stowers A; Nhan D H; Coppel R L
CS Department of Microbiology, Monash University, Clayton, Victoria 3800, Australia.
SO INFECTION AND IMMUNITY, (2001 Jul) 69 (7) 4390-7.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200107
ED Entered STN: 20010723
Last Updated on STN: 20010723
Entered Medline: 20010719
AB **Merozoite surface protein** 4 (MSP4) of **Plasmodium falciparum** is a glycosylphosphatidylinositol-anchored integral membrane protein that is being developed as a component of a subunit **vaccine** against malaria. We report here the measurement of naturally acquired antibodies to MSP4 in a population of individuals living in the Khanh-Hoa region of Vietnam, an area where malaria is highly endemic. Antibodies to MSP4 were detected in 94% of the study population at titers of 1:5,000 or greater. Two forms of recombinant MSP4 produced in either Escherichia coli or Saccharomyces cerevisiae were compared as substrates in the enzyme-linked immunosorbent assay. There was an excellent correlation between reactivity measured to either, although the yeast substrate was recognized by a higher percentage of sera. Four different regions of MSP4 were recognized by human antibodies, demonstrating that there are at least four distinct epitopes

in this protein. In the carboxyl terminus, where the single epidermal growth factor-like domain is located, the reactive epitope(s) was shown to be conformation dependent, as disruption of the disulfide bonds almost completely abolished reactivity with human antibodies. The anti-MSP4 antibodies were mainly of the immunoglobulin G1 (IgG1) and IgG3 subclasses, suggesting that such antibodies may play a role in opsonization and complement-mediated lysis of free merozoites. Individuals in the study population were drug-cured and followed up for 6 months; no significant correlation was observed between the anti-MSP4 antibodies and the absence of parasitemia during the surveillance period. As a comparison, antibodies to MSP1(19), a leading **vaccine** candidate, were measured, and no correlation with protection was observed in these individuals. The anti-MSP1(19) antibodies were predominantly of the IgG1 isotype, in contrast to the IgG3 predominance noted for MSP4.

L16 ANSWER 46 OF 195 MEDLINE on STN
AN 2001285377 MEDLINE
DN 21116968 PubMed ID: 11179324
TI Efficacy of two alternate **vaccines** based on **Plasmodium falciparum merozoite surface protein** 1 in an Aotus challenge trial.
AU Stowers A W; Cioce V; Shimp R L; Lawson M; Hui G; Muratova O; Kaslow D C; Robinson R; Long C A; Miller L H
CS Malaria Vaccine Development Unit, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Inc., Rockville, Maryland 20852, USA.. astowers@niaid.nih.gov
SO INFECTION AND IMMUNITY, (2001 Mar) 69 (3) 1536-46.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200105
ED Entered STN: 20010529
Last Updated on STN: 20010529
Entered Medline: 20010524
AB In an attempt to produce a more defined, clinical-grade version of a **vaccine** based on **Plasmodium falciparum merozoite surface protein** 1 (MSP1), we evaluated the efficacy of two recombinant forms of MSP1 in an Aotus nancymai challenge model system. One recombinant **vaccine**, bvMSP1(42), based on the 42-kDa C-terminal portion of MSP1, was expressed as a secreted protein in baculovirus-infected insect cells. A highly pure baculovirus product could be reproducibly expressed and purified at yields in excess of 8 mg of pure protein per liter of culture. This protein, when tested for efficacy in the Aotus challenge model, gave significant protection, with only one of seven monkeys requiring treatment for uncontrolled parasitemia after challenge with P. falciparum. The second recombinant protein, P30P2MSP1(19), has been used in previous studies and is based on the smaller, C-terminal 19-kDa portion of MSP1 expressed in Saccharomyces cerevisiae. Substantial changes were made in its production process to optimize expression. The optimum form of this **vaccine** antigen (as judged by in vitro and in vivo indicators) was then evaluated, along with bvMSP1(42), for efficacy in the A. nancymai system. The new formulation of P30P3MSP1(19) performed significantly worse than bvMSP1(42) and appeared to be less efficacious than we have found in the past, with four of seven monkeys in the vaccinated group requiring treatment for uncontrolled parasitemia. With both antigens, protection was seen only when high antibody levels were obtained by formulation of the **vaccines** in Freund's adjuvant. **Vaccine** formulation in an alternate adjuvant, MF59, resulted in significantly lower antibody titers and no protection.

L16 ANSWER 47 OF 195 MEDLINE on STN
AN 2001349830 MEDLINE
DN 21306179 PubMed ID: 11413195
TI Antibodies against **merozoite surface protein** (**MSP**)-1(19) are a major component of the invasion-inhibitory response in individuals immune to malaria.
CM Comment in: J Exp Med. 2001 Jun 18;193(12):F51-4
AU O'Donnell R A; de Koning-Ward T F; Burt R A; Bockarie M; Reeder J C; Cowman A F; Crabb B S
CS Department of Microbiology & Immunology and the Co-operative Research Centre for Vaccine Technology, University of Melbourne, VIC 3010, Australia.
SO JOURNAL OF EXPERIMENTAL MEDICINE, (2001 Jun 18) 193 (12) 1403-12. Journal code: 2985109R. ISSN: 0022-1007.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200108
ED Entered STN: 20010813
Last Updated on STN: 20010813
Entered Medline: 20010809
AB Antibodies that bind to antigens expressed on the merozoite form of the malaria parasite can inhibit parasite growth by preventing merozoite invasion of red blood cells. Inhibitory antibodies are found in the sera of malaria-immune individuals, however, the specificity of those that are important to this process is not known. In this paper, we have used allelic replacement to construct a **Plasmodium falciparum** parasite line that expresses the complete COOH-terminal fragment of **merozoite surface protein** (**MSP**)-1(19) from the divergent rodent malaria P. chabaudi. By comparing this transfected line with parental parasites that differ only in **MSP**-1(19), we show that antibodies specific for this domain are a major component of the inhibitory response in P. falciparum-immune humans and P. chabaudi-immune mice. In some individual human sera, **MSP**-1(19) antibodies dominated the inhibitory activity. The finding that antibodies to a small region of a single protein play a major role in this process has important implications for malaria immunity and is strongly supportive of further understanding and development of **MSP**-1(19)-based **vaccines**.

L16 ANSWER 48 OF 195 MEDLINE on STN
AN 2001248189 MEDLINE
DN 21189423 PubMed ID: 11292349
TI Inhibitory and blocking monoclonal antibody epitopes on **merozoite surface protein** 1 of the malaria parasite **Plasmodium falciparum**.
AU Uthaipibull C; Aufiero B; Syed S E; Hansen B; Guevara Patino J A; Angov E; Ling I T; Fegeding K; Morgan W D; Ockenhouse C; Birdsall B; Feeney J; Lyon J A; Holder A A
CS Division of Parasitology, Walter Reed Army Institute of Research, Washington, DC, USA.
SO JOURNAL OF MOLECULAR BIOLOGY, (2001 Apr 13) 307 (5) 1381-94. Journal code: 2985088R. ISSN: 0022-2836.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS PDB-1CEJ
EM 200105
ED Entered STN: 20010517
Last Updated on STN: 20010702
Entered Medline: 20010510

AB **Merozoite surface protein** 1 (**MSP**
-1) is a precursor to major antigens on the surface of Plasmodium spp. merozoites, which are involved in erythrocyte binding and invasion. **MSP**-1 is initially processed into smaller fragments; and at the time of erythrocyte invasion one of these of 42 kDa (**MSP**-1(42)) is subjected to a second processing, producing 33 kDa and 19 kDa fragments (**MSP**-1(33) and **MSP**-1(19)). Certain **MSP**
-1-specific monoclonal antibodies (mAbs) react with conformational epitopes contained within the two epidermal growth factor domains that comprise **MSP**-1(19), and are classified as either inhibitory (inhibit processing of **MSP**-1(42) and erythrocyte invasion), blocking (block the binding and function of the inhibitory mAb), or neutral (neither inhibitory nor blocking). We have mapped the epitopes for inhibitory mAbs 12.8 and 12.10, and blocking mAbs such as 1E1 and 7.5 by using site-directed mutagenesis to change specific amino acid residues in **MSP**-1(19) and abolish antibody binding, and by using PEPSCAN to measure the reaction of the antibodies with every octapeptide within **MSP**-1(42). Twenty-six individual amino acid residue changes were made and the effect of each on the binding of mAbs was assessed by Western blotting and BIAcore analysis. Individual changes had either no effect, or reduced, or completely abolished the binding of individual mAbs. No two antibodies had an identical pattern of reactivity with the modified proteins. Using PEPSCAN each mAb reacted with a number of octapeptides, most of which were derived from within the first epidermal growth factor domain, although 1E1 also reacted with peptides spanning the processing site. When the single amino acid changes and the reactive peptides were mapped onto the three-dimensional structure of **MSP**-1(19), it was apparent that the epitopes for the mAbs could be defined more fully by using a combination of both mutagenesis and PEPSCAN than by either method alone, and differences in the fine specificity of binding for all the different antibodies could be distinguished. The incorporation of several specific amino acid changes enabled the design of proteins that bound inhibitory but not blocking antibodies. These may be suitable for the development of **MSP**-1-based **vaccines** against malaria.

L16 ANSWER 49 OF 195 MEDLINE on STN
AN 2001148110 MEDLINE
DN 21101050 PubMed ID: 11159995
TI Familial correlation of immunoglobulin G subclass responses to **Plasmodium falciparum** antigens in Burkina Faso.
AU Aucan C; Traore Y; Fumoux F; Rihet P
CS Universite de la Mediterranee, EA 864, Marseille, France.
SO INFECTION AND IMMUNITY, (2001 Feb) 69 (2) 996-1001.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200103
ED Entered STN: 20010404
Last Updated on STN: 20010404
Entered Medline: 20010315
AB Host genes are thought to determine the immune response to malaria infection and the outcome. Cytophilic antibodies have been associated with protection, whereas noncytophilic antibodies against the same epitopes may block the protective activity of the protective ones. To assess the contribution of genetic factors to immunoglobulin G (IgG) subclass responses against conserved epitopes and **Plasmodium falciparum** blood-stage extracts, we analyzed the isotypic distribution of the IgG responses in 366 individuals living in two differently exposed areas in Burkina Faso. We used one-way analysis of variance and pairwise estimators to calculate sib-sib and parent-offspring

correlation coefficients, respectively. Familial patterns of inheritance of IgG subclass responses to defined antigens and P. falciparum extracts appear to be similar in the two areas. We observed a sibling correlation for the IgG, IgG1, IgG2, IgG3, and IgG4 responses directed against ring-infected-erythrocyte surface antigen, **merozoite surface protein** 1 (**MSP**-1), **MSP**-2, and P. falciparum extract. Moreover, a parent-offspring correlation was found for several IgG subclass responses, including the IgG, IgG1, IgG2, IgG3, and IgG4 responses directed against conserved **MSP**-2 epitopes. Our results indicated that the IgG subclass responses against P. falciparum blood-stage antigens are partly influenced by host genetic factors. The localization and identification of these genes may have implications for immunoepidemiology and **vaccine** development.

L16 ANSWER 50 OF 195 MEDLINE on STN
AN 2001694061 MEDLINE
DN 21606004 PubMed ID: 11738757
TI Immune response induced by recombinant BCG expressing merozoite surface antigen 2 from **Plasmodium falciparum**.
AU Zheng C; Xie P; Chen Y
CS Institute of Infectious and Parasitic Diseases, The First Affiliated Hospital of Chongqing Medical University, Chongqing 400 016, People's Republic of China.. zhengchunfu@163.net
SO VACCINE, (2001 Dec 12) 20 (5-6) 914-9.
Journal code: 8406899. ISSN: 0264-410X.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200204
ED Entered STN: 20011217
Last Updated on STN: 20020413
Entered Medline: 20020412
AB Mycobacterium bovis bacillus Calmette-Guerin (BCG) has been used as a live bacterial **vaccine** to immunize >3 billion people against tuberculosis. In an attempt to use this vaccinal strain as a vehicle for protective antigens, the recombinant BCG (rBCG), expressing merozoite surface antigen 2 (MSA2) from **Plasmodium falciparum** under the control of an expression cassette carrying the promoter of heat shock protein 70 (HSP70) from M. tuberculosis, was constructed and used to immunize BABL/c mice. The administration of rBCG producing MSA2 (BCG-MSA2) resulted in the induction of a strong humoral and cellular response directed against MSA2. These results encourage the further protection testing of BCG-MSA2 **vaccines** in primate models.

L16 ANSWER 51 OF 195 MEDLINE on STN
AN 2002036733 MEDLINE
DN 21630571 PubMed ID: 11756021
TI Malaria invades Yorkshire.
AU Hviid L
CS Centre for Medical Parasitology, Dept of Infectious Diseases M7641, Rigshospitalet, Blegdamsvej 9, 2100, Copenhagen, Denmark.. lhcmp@rh.dk
SO Trends Parasitol, (2001 Dec) 17 (12) 568.
Journal code: 100966034. ISSN: 1471-4922.
CY England: United Kingdom
DT Conference; Conference Article; (CONGRESSES)
LA English
FS Priority Journals
EM 200205
ED Entered STN: 20020124
Last Updated on STN: 20020505
Entered Medline: 20020503

L16 ANSWER 52 OF 195 MEDLINE on STN
AN 2001550059 MEDLINE
DN 21480473 PubMed ID: 11596920
TI Differential antibody recognition of four allelic variants of the **merozoite surface protein**-2 (**MSP**-2) of **Plasmodium falciparum**.
AU Tonhosolo R; Wunderlich G; Ferreira M U
CS Department of Parasitology, Institute for Biomedical Sciences, University of Sao Paulo, SP, Brazil.
SO JOURNAL OF EUKARYOTIC MICROBIOLOGY, (2001 Sep-Oct) 48 (5) 556-64. Journal code: 9306405. ISSN: 1066-5234.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200203
ED Entered STN: 20011015
Last Updated on STN: 20020307
Entered Medline: 20020306
AB The **merozoite surface protein**-2 (**MSP**-2) is a major **vaccine** candidate for the asexual blood stage of **Plasmodium falciparum**. **MSP**-2 is essentially dimorphic, and allelic families are named after the representative isolates FC27 and IC1. The polymorphic central region contains immunodominant repeats, which vary in number, length, and sequence within and between allelic families. We have examined the antibody recognition of repeat regions from both **MSP**-2 allelic families expressed as recombinant fusion peptides. The results are summarized as follows. (1) Immunization of mice with the fusion peptides elicited IgG antibodies that cross-reacted with the native **MSP**-2 molecule in an allelic family-specific manner. (2) These mouse antibodies recognized the recombinant proteins in both a variant-specific and a family-specific manner, as shown in inhibition immunoassays. Antibodies raised against the peptide FC27 seemed to be essentially variant-specific, since the soluble form of the S20 antigen (a member of FC27 family) had relatively little inhibitory effect on them. (3) The overall pattern of human IgG antibody responses to **MSP**-2 in Karitiana Indians, a population continuously exposed to hypoendemic malaria in the Brazilian Amazon Region, differs from that described in hyperendemic areas in Africa and Papua New Guinea in two important features: there was no clear age-dependent increase in the prevalence and mean concentration of specific IgG antibodies, and there was no skewing towards the IgG3 subclass in antibody responses. (4) The relatively poor correlation between concentrations of IgG antibodies that are specific for members of the same allelic family suggests that recognition of **MSP**-2 peptides by naturally acquired antibodies was largely variant-specific in this population. The potential role of naturally acquired variant-specific antibodies in immune evasion, by selecting mutant parasites carrying insertions or deletions of repeat sequences, is briefly discussed.

L16 ANSWER 53 OF 195 MEDLINE on STN
AN 2001158437 MEDLINE
DN 21099476 PubMed ID: 11180119
TI Fixed, epitope-specific, cytophilic antibody response to the polymorphic block 2 domain of the **Plasmodium falciparum** merozoite surface antigen **MSP**-1 in humans living in a malaria-endemic area.
AU Jouin H; Rogier C; Trape J F; Mercereau-Puijalon O
CS Unite d'Immunologie Moleculaire des Parasites, CNRS URA 1960, Institut Pasteur, Paris, France.. hajouin@pasteur.fr
SO EUROPEAN JOURNAL OF IMMUNOLOGY, (2001 Feb) 31 (2) 539-50. Journal code: 1273201. ISSN: 0014-2980.

CY Germany: Germany, Federal Republic of
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200103
ED Entered STN: 20010404
Last Updated on STN: 20010404
Entered Medline: 20010322
AB The **MSP**-1 merozoite surface antigen of the human malaria parasite **Plasmodium falciparum** is a major target of immune response. The domain called block 2 shows extensive allelic diversity, with more than 50 alleles identified, grouped into three allelic families. Presence of anti-block 2 antibodies has been associated with reduced risk for clinical malaria, but whether or not allele-specific antibodies are implicated remains unclear. To study the fine specificity of the human antibody response, we have used a series of 82 overlapping, N-biotinylated, 15-mer peptides scanning reference alleles and including numerous sequence variants. Peptide antigenicity was validated using sera from mice immunized with recombinant proteins. A cross-sectional survey conducted in a Senegalese village with intense malaria transmission indicated an overall 56 % seroprevalence. The response was specific for individuals and unrelated to the HLA type. Each responder reacted to a few peptides, unrelated to the infecting parasite genotype(s). Seroprevalence of each individual peptide was low, with no identifiable immunodominant epitope. Anti-block 2 antibodies were mostly of the IgG3 isotype, consistent with an involvement in cytophilic antibody-mediated merozoite clearance. The number of responders increased with age, but there was no accumulation of novel specificities with age and hence with exposure to an increasingly large number of alleles. A 15-month longitudinal follow up outlined a remarkably fixed response, with identical reactivity profiles, independent of the past or current parasite types, a pattern reminiscent of clonal imprinting. The implications of the characteristics of the anti-block 2 antibody response in parasite clearance are discussed.

L16 ANSWER 54 OF 195 MEDLINE on STN
AN 2001677440 MEDLINE
DN 21580458 PubMed ID: 11722185
TI High-level production and purification of P30P2MSP1(19), an important **vaccine** antigen for malaria, expressed in the methylotropic yeast Pichia pastoris.
AU Brady C P; Shimp R L; Miles A P; Whitmore M; Stowers A W
CS Malaria Vaccine Development Unit, Laboratory of Parasitic Diseases, Rockville, Maryland 20852, USA.
SO PROTEIN EXPRESSION AND PURIFICATION, (2001 Dec) 23 (3) 468-75.
Journal code: 9101496. ISSN: 1046-5928.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200204
ED Entered STN: 20011128
Last Updated on STN: 20020501
Entered Medline: 20020430
AB P30P2MSP1(19) is a recombinant subunit **vaccine** derived from **merozoite surface protein** 1 (MSP1) of **Plasmodium falciparum**, the causative agent of malaria. P30P2MSP1(19) consists of two universal T-cell epitopes fused to the most C-terminal 19-kDa portion of MSP1, and this protein has previously shown promising potential as a **vaccine** for malaria. However, previous attempts at producing this molecule in Saccharomyces cerevisiae resulted in the production of a truncated form of the molecule missing most of the universal T-cell epitopes. Here, we report the production of full-length

P30P2MSP1(19) in Pichia pastoris. As salt precipitation is a common problem during P. pastoris high-density fermentation, we utilized an alternative low-salt, fully defined medium that did not reduce growth rates or biomass yields to avoid precipitation. A total of 500 mg/L of secreted purified protein was produced in high cell density fermentation and the protein was purified in one step utilizing nickel-chelate chromatography. P30P2MSP1(19) produced in Pichia was reactive with monoclonal antibodies that recognize only conformational epitopes on correctly folded MSP1. Rabbits immunized with this molecule generated higher and more uniform antibody titers than rabbits immunized with the protein produced in Saccharomyces. P30P2MSP1(19) produced in Pichia may prove to be a more efficacious **vaccine** than that produced in Saccharomyces and Pichia would provide a system for the cost-effective production of such a **vaccine**.

L16 ANSWER 55 OF 195 MEDLINE on STN
AN 2002021545 MEDLINE
DN 21349158 PubMed ID: 11456319
TI Sequence diversity and linkage disequilibrium within the **merozoite surface protein**-1 (**Msp**-1) locus of **Plasmodium falciparum**: a longitudinal study in Brazil.
AU Da Silveira L A; Ribeiro W L; Kirchgatter K; Wunderlich G; Matsuoka H; Tanabe K; Ferreira M U
CS Department of Parasitology, Institute for Biomedical Sciences, University of Sao Paulo, Cidade Universitaria, SP, Brazil.
SO JOURNAL OF EUKARYOTIC MICROBIOLOGY, (2001 Jul-Aug) 48 (4) 433-9.
Journal code: 9306405. ISSN: 1066-5234.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF290875; GENBANK-AF290876
EM 200203
ED Entered STN: 20020121
Last Updated on STN: 20020403
Entered Medline: 20020327
AB The **merozoite surface protein**-1 (**MSP**-1) is a major **vaccine** candidate for the asexual blood stage of malaria. We examined both the extent of sequence diversity in block 17, the 3' end of **Msp**-1 gene coding for a 19-kDa polypeptide (**MSP**-1(19)) putatively involved in red blood cell binding, and the patterns of linkage disequilibrium between polymorphic sites throughout the **Msp**-1 locus. The parasite population sample consisted of **Plasmodium falciparum** isolates collected between 1985 and 1998 in Rondjnia, an area of hypoendemic malaria transmission in the southwestern Brazilian Amazon. Results were summarized as follows. (1) Seven block-17 sequence variants or haplotypes were found among 130 isolates, including two new haplotypes (novel combinations of previously reported amino acid replacements), here named Brazil-1 (E-TSR-F) and Brazil-2 (Q-TSR-F). (2) As previously shown for other **Msp**-1 polymorphisms, frequencies of block-17 haplotypes displayed significant temporal variation. (3) Extensive linkage disequilibrium was demonstrated between neighboring dimorphic sites within block 17, as well as between polymorphisms at the 5' and 3' ends of **Msp**-1 (map distance range: 3.83-4.99 kb). (4) The overall patterns of linkage disequilibrium within **Msp**-1 remained stable over a period of nearly one decade, and examples of possible 'epidemic' expansion of parasites carrying particular **Msp**-1 alleles were found in the 1980s and 1990s. These results are discussed in relation to the population biology of P. falciparum and the development of malaria **vaccines** based on **MSP**-1.

L16 ANSWER 56 OF 195 MEDLINE on STN
AN 2001297920 MEDLINE
DN 21273140 PubMed ID: 11378201
TI **Merozoite surface protein** 8 of **Plasmodium falciparum** contains two epidermal growth factor-like domains.
AU Black C G; Wu T; Wang L; Hibbs A R; Coppel R L
CS Department of Microbiology, PO Box 53, Monash University, 3800, Victoria, Australia.
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2001 May) 114 (2) 217-26. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF325256; GENBANK-AF325257; GENBANK-AF325258; GENBANK-AF325259; GENBANK-AF325260; GENBANK-AF325261
EM 200108
ED Entered STN: 20010806
Last Updated on STN: 20010806
Entered Medline: 20010802
AB By motif searching of the unfinished sequences in the Malaria Genome Sequencing Project databases we have identified a novel EGF-like domain-containing protein of **Plasmodium falciparum**. The sequence lies within a single open reading frame of 1791 bp and is predicted to encode a polypeptide of 597 amino acids. There are hydrophobic regions at the extreme N- and C-termini, which could represent secretory signal peptide and GPI attachment sites, respectively. Similar to MSP1, there are two EGF-like domains located near the C-terminus. RT-PCR analysis of the novel gene shows that it is transcribed in asexual stages of the malaria parasite. We have expressed portions of the protein as recombinant GST fusions in Escherichia coli and raised antisera in rabbits. Antibodies to the EGF-like domains of the novel protein are highly specific and do not cross-react with the EGF-like domains of MSP1, MSP4 or MSP5 expressed as GST fusion proteins. Antiserum raised to the most C-terminal region of the protein reacts with four bands of 98, 50, 25 and 19 kDa in P. falciparum parasite lysates whereas antisera to the N-terminal fusion proteins recognise the 98 and 50 kDa bands, suggesting that the novel protein may undergo processing in a similar way to MSP1. Immunoblot analysis of stage-specific parasite samples reveals that the protein is present throughout the parasite asexual life cycle and in isolated merozoites, with the smaller fragments present in ring stage parasites. The protein partitions in the detergent-enriched phase after Triton X-114 fractionation and is localized to the surfaces of trophozoites, schizonts and free merozoites by indirect immunofluorescence. Antisera to the C-terminus stain the surface of rings, whereas antisera to the N-terminus do not, suggesting that a fragment of the protein is carried into the developing ring stage parasite. Based on the accepted nomenclature in the field we designate this protein MSP8. We have shown that the MSP8 fusion proteins are in a conformation that can be recognised by human immune sera and that there is very limited diversity in the MSP8 gene sequences from various P. falciparum laboratory isolates. MSP8 shows significant similarity to the recently reported sequence of the protective P. yoelii **merozoite surface protein** pypAg-2 [Burns JM, Belk CC, Dunn PD. Infect Immun 2000;68:6189-95.] suggesting that the two proteins are homologues. Taken together, these findings suggest that MSP8/pypAg-2 may play an important role in the process of red cell invasion and is a potential malaria **vaccine** candidate.

L16 ANSWER 57 OF 195 MEDLINE on STN
AN 2001388545 MEDLINE
DN 21335207 PubMed ID: 11442218

TI Short report: IgG1/IgG3 antibody responses to various analogs of recombinant ypfmsp119--a study in immune adults living in areas of **Plasmodium falciparum** transmission.
AU Diallo T O; Spiegel A; Diouf A; Perraut R; Kaslow D C; Garraud O
CS Unite d'Immunologie, Institut Pasteur, Dakar, Senega.
SO AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (2001 Mar-Apr) 64 (3-4) 204-6.
Journal code: 0370507. ISSN: 0002-9637.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 200107
ED Entered STN: 20010730
Last Updated on STN: 20010730
Entered Medline: 20010726
AB To further characterize protective-type (IgG1/IgG3) antibody responses to **Plasmodium falciparum** blood stage in putatively immune individuals' plasma, we have tested for various analogs of the 19 kDa C-terminus of the MSP1 antigen obtained as secreted recombinant proteins from Saccharomyces cerevisiae. One of four proteins was then identified on the basis of consistent IgG3, along with less variable IgG1 recognition. This protein has thus been selected for further functional assays of IgG1/IgG3 antibodies.

L16 ANSWER 58 OF 195 MEDLINE on STN
AN 2001388544 MEDLINE
DN 21335206 PubMed ID: 11442217
TI Identification of frequently recognized dimorphic T-cell epitopes in **plasmodium falciparum merozoite surface protein**-1 in West and East Africans: lack of correlation of immune recognition and allelic prevalence.
AU Lee E A; Flanagan K L; Odhiambo K; Reece W H; Potter C; Bailey R; Marsh K; Pinder M; Hill A V; Plebanski M
CS Institute of Molecular Medicine, Nuffield Department Medicine, University of Oxford, John Radcliffe Hospital, United Kingdom.. elee@molbiol.ox.ac.uk
SO AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (2001 Mar-Apr) 64 (3-4) 194-203.
Journal code: 0370507. ISSN: 0002-9637.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 200107
ED Entered STN: 20010730
Last Updated on STN: 20010730
Entered Medline: 20010726
AB The **merozoite surface protein**-1 (MSP1) is the most studied malaria blood-stage **vaccine** candidate. Lymphokines such as interferon gamma (IFN-gamma) and interleukin 4 (IL-4) may mediate blood-stage specific protection. Here we identify Plasmodiumfalciparum MSP1 T-cell epitopes capable of rapid induction of IFN-gamma and/or IL-4 from peripheral blood mononuclear cells of East and West African donors. Both allelic forms of these novel MSP1 T-cell epitopes were stimulatory. An unusually high numbers of Gambian responders (> 80%) to these epitopes were observed, suggesting that MSPI reactivity may have been underestimated previously in this population. Surprisingly, IFN-gamma responses to allelic T-cell epitopes failed to correlate with differential antigenic exposure in The Gambia compared to Kenya. These results suggest an unexpected level of immunoregulation of IFN-gamma response with variable allelic T-cell reactivity independent of the level of antigenic exposure. Further analysis of the mechanisms determining this response pattern may be required if **vaccines**

are to overcome this allelic reactivity bias in malaria-exposed populations.

L16 ANSWER 59 OF 195 MEDLINE on STN
AN 2001434974 MEDLINE
DN 21180526 PubMed ID: 11282510
TI Antibodies and **Plasmodium falciparum** merozoites.
AU Ramasamy R; Ramasamy M; Yasawardena S
CS Dept. of Genetics, University of Groningen, Kerklaan 30, 9751 NN, Haren, The Netherlands.. r.ramasamy@biol.rug.nl
SO Trends Parasitol, (2001 Apr) 17 (4) 194-7. Ref: 24
Journal code: 100966034. ISSN: 1471-4922.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 200108
ED Entered STN: 20010806
Last Updated on STN: 20010806
Entered Medline: 20010802
AB There is considerable interest in using merozoite proteins in a **vaccine** against falciparum malaria. Observations that antibodies to **merozoite surface proteins** block invasion are a basis for optimism. This article draws attention to important and varied aspects of how antibodies to **Plasmodium falciparum** merozoites affect red blood cell invasion.

L16 ANSWER 60 OF 195 MEDLINE on STN
AN 2001209893 MEDLINE
DN 21194620 PubMed ID: 11299119
TI Geographical patterns of allelic diversity in the **Plasmodium falciparum** malaria-**vaccine** candidate, **merozoite surface protein**-2.
AU Hoffmann E H; da Silveira L A; Tonhosolo R; Pereira F J; Ribeiro W L; Tonon A P; Kawamoto F; Ferreira M U
CS Department of Parasitology, Institute for Biomedical Sciences, University of Sao Paulo, Sao Paulo, Brazil.
SO ANNALS OF TROPICAL MEDICINE AND PARASITOLOGY, (2001 Mar) 95 (2) 117-32.
Journal code: 2985178R. ISSN: 0003-4983.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200105
ED Entered STN: 20010604
Last Updated on STN: 20010604
Entered Medline: 20010531
AB The polymorphic **merozoite surface protein**-2 (**MSP**-2) of **Plasmodium falciparum** is a major malaria-**vaccine** candidate. In the present study, PCR and hybridization with allelic-specific probes were used to type the **Msp**-2 gene from isolates from hypo-endemic Brazil (N = 113), meso-endemic Vietnam (N = 208) and holo-endemic Tanzania (N = 67). The typing methods were designed to group isolates into the dimorphic allelic families FC27 and IC1 and to detect possible between-family recombination events. The analysis was complemented by a comparison of 156 **Msp**-2 sequences from the GenBank database with 12 additional sequences obtained during the present study. Statistically significant differences were detected in pair-wise comparisons of the distribution of **Msp**-2 allelic types in Brazil and Vietnam, and in Brazil and Tanzania, but not in Vietnam and Tanzania. The extent of allelic diversity in the

Msp-2 gene, as estimated by the total number of different alleles found in a given parasite population and the mean multiplicity of infections, clearly paralleled the levels of malaria endemicity in the study areas. However, no correlation between age and multiplicity of infections was found in the subjects. The patterns of **Msp**-2 diversity in Brazil appeared to be temporally stable, since no significant difference was observed in the distribution of **Msp**-2 allelic types among isolates collected, 10--13 years apart, in the same area of Rondonia. Despite the extensive sequence diversity found in **Msp** -2 alleles, especially in the central repetitive region of the molecule, several instances of identical or nearly identical alleles were found among isolates from different countries and regions, possibly as a result of extensive homoplasy. No recombinant allele was detected by molecular typing in any of the study sites, and the GenBank database included only 12 recombinant sequences (representing 7% of all reported **Msp**-2 sequences), all of them with an IC1-type 5' end and an FC27-type 3' end. A single, putative, crossover site was characterised for all recombinant alleles. Most of the allelic diversity observed was therefore attributable to variation in the repetitive region of the gene, instead of recombination between alleles of dimorphic families (as commonly found, for example, in the **Msp**-1 gene). The implications of these findings for studies on the genetic and antigenic diversity of malarial parasites are discussed.

L16 ANSWER 61 OF 195 MEDLINE on STN
AN 2001343278 MEDLINE
DN 21299529 PubMed ID: 11406156
TI Herpesvirus saimiri transformed T cells and peripheral blood mononuclear cells restimulate identical antigen-specific human T cell clones.
AU Daubenberger C A; Nickel B; Hubner B; Siegler U; Meinl E; Pluschke G
CS Molecular Immunology, Swiss Tropical Institute, Socinstrasse 57, CH 4002 Basel, Switzerland.. Claudia.Daubenberger@unibas.ch
SO JOURNAL OF IMMUNOLOGICAL METHODS, (2001 Aug 1) 254 (1-2) 99-108. Journal code: 1305440. ISSN: 0022-1759.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200108
ED Entered STN: 20010813
Last Updated on STN: 20010813
Entered Medline: 20010809
AB Panels of human antigen-specific T cell clones (TCC) have been established by limiting dilution using Herpesvirus saimiri (HVS) subtype C transformed T cells as antigen presenting cells (APC). They showed antigen-specific proliferation when peripheral blood mononuclear cells (PBMC), HVS-transformed T cells and Epstein Barr Virus transformed lymphoblastoid B cell lines (EBV-LCL) were used as APC. All T cell clones were CD4+ and HLA class II restricted. For a detailed analysis, two panels of T cell clones specific for an epitope located in the N-terminus of the **Merozoite Surface Protein** 1 (**MSP**-1) of **Plasmodium falciparum** were established from the same founder T cell line using either PBMC or HVS-transformed T cells as APC. TCR analysis of the two panels of TCC demonstrated that the same founder cells could be propagated in both culture systems. Furthermore, no difference in the cytokine expression pattern or antigen processing and co-stimulatory requirements was observed between TCC established on PBMC or HVS-transformed T cells. Based on the finding that HVS-transformed T cells can replace PBMC as APC for isolation and propagation of antigen-specific TCC, a protocol was developed and successfully executed, which allows to establish and maintain **vaccine**-specific T cell clones from 20 ml of blood. This method might be particularly significant in clinical trials of immune intervention strategies.

L16 ANSWER 62 OF 195 MEDLINE on STN
AN 2001301332 MEDLINE
DN 21101372 PubMed ID: 11165271
TI Assessment of a vaccinia virus vectored multi-epitope live **vaccine** candidate for **Plasmodium falciparum**.
AU Dong W; Li M; Bi H; Li Y; Wu J; Qu L
CS Institute of Tropical Medicine, First Military Medical University, 510515, Guangzhou, China.. dongwq63@263.net
SO INTERNATIONAL JOURNAL FOR PARASITOLOGY, (2001 Jan) 31 (1) 57-62.
Journal code: 0314024. ISSN: 0020-7519.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200105
ED Entered STN: 20010604
Last Updated on STN: 20010604
Entered Medline: 20010531
AB We constructed a live recombinant vaccinia virus **vaccine** candidate containing a synthesised hybrid gene termed 'HGFSP' encoding circumsporozoite protein (CSP), major merozoite surface antigen-1(MSA1), major merozoite surface antigen-2 (MSA2), and ring-infected erythrocyte surface antigen (RESA) of **Plasmodium falciparum**, interleukin-1 (IL-1) and tetanus toxin (TT) epitopes. Anti-recombinant vaccinia virus rabbit sera and IgG were tested in inhibition experiments in vitro. Results showed that the recombinant vaccinia virus had some capability to inhibit the growth of P. falciparum in vitro. The sera of rabbits, rats, and mice immunised with recombinant virus showed obvious IL-2 activity 4-6 weeks after immunisation. The interferon (IFN) level of sera from these animals 6 weeks after immunisation was significantly higher than before immunisation. These results indicate that the recombinant vaccinia virus can stimulate cell mediated responses (Th1 cell response) in immunised animals, and has the capability to inhibit multiplication of in vitro cultured P. falciparum. Thus this recombinant vaccinia virus is an appropriate **vaccine** candidate for further evaluation in Aotus monkey or human clinical trails.

L16 ANSWER 63 OF 195 MEDLINE on STN
AN 2001021217 MEDLINE
DN 20448970 PubMed ID: 10992516
TI Immunization with recombinant Plasmodium yoelii **merozoite surface protein** 4/5 protects mice against lethal challenge.
AU Kedzierski L; Black C G; Coppel R L
CS Department of Microbiology, Monash University 3800, Victoria, Australia.
SO INFECTION AND IMMUNITY, (2000 Oct) 68 (10) 6034-7.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200011
ED Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20001103
AB Plasmodium yoelii **merozoite surface protein** 4/5 (PyMSP4/5), expressed as a recombinant protein, was highly effective at protecting mice against lethal challenge with P. yoelii. There was a significant correlation between prechallenge antibody levels and peak parasitemia, suggesting that the homologues of PyMSP4/5 in **Plasmodium falciparum** are promising components of a subunit **vaccine** against malaria.

L16 ANSWER 64 OF 195 MEDLINE on STN
AN 2000231805 MEDLINE
DN 20231805 PubMed ID: 10768960
TI Characterization of conserved T- and B-cell epitopes in **Plasmodium falciparum** major **merozoite surface protein** 1.
AU Parra M; Hui G; Johnson A H; Berzofsky J A; Roberts T; Quakyi I A; Taylor D W
CS Departments of Biology, Georgetown University, Washington, DC 20057, USA.. Parram@gusun.georgetown.edu
NC N01-AI45242 (NIAID)
R21-AI37943 (NIAID)
SO INFECTION AND IMMUNITY, (2000 May) 68 (5) 2685-91.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200006
ED Entered STN: 20000622
Last Updated on STN: 20000622
Entered Medline: 20000613
AB **Vaccines** for P. falciparum will need to contain both T- and B-cell epitopes. Conserved epitopes are the most desirable, but they are often poorly immunogenic. The major **merozoite surface protein** 1 (**MSP**-1) is currently a leading **vaccine** candidate antigen. In this study, six peptides from conserved or partly conserved regions of **MSP**-1 were evaluated for immunogenicity in B10 congenic mice. Following immunization with the peptides, murine T cells were tested for the ability to proliferate in vitro and antibody responses to **MSP**-1 were evaluated in vivo. The results showed that one highly conserved sequence (**MSP**-1#1, VTHESYQELVKKLEALEDAV; located at amino acid positions 20 to 39) and one partly conserved sequence (**MSP**-1#23, GLFHKEKMILNEEEITTKGA; located at positions 44 to 63) contained both T- and B-cell epitopes. Immunization of mice with these peptides resulted in T-cell proliferation and enhanced production of antibody to **MSP**-1 upon exposure to merozoites. **MSP**-1#1 stimulated T-cell responses in three of the six strains of mice evaluated, whereas **MSP**-1#23 was immunogenic in only one strain. Immunization with the other four peptides resulted in T-cell responses to the peptides, but none of the resulting peptide-specific T cells recognized native **MSP**-1. These results demonstrate that two sequences located in the N terminus of **MSP** -1 can induce T- and B-cell responses following immunization in a murine model. Clearly, these sequences merit further consideration for inclusion in a **vaccine** for malaria.

L16 ANSWER 65 OF 195 MEDLINE on STN
AN 2000407870 MEDLINE
DN 20240168 PubMed ID: 10775784
TI Safety and immunogenicity of a three-component blood-stage malaria **vaccine** in adults living in an endemic area of Papua New Guinea.
AU Genton B; Al-Yaman F; Anders R; Saul A; Brown G; Pye D; Irving D O; Briggs W R; Mai A; Ginny M; Adiguma T; Rare L; Giddy A; Reber-Liske R; Stuerchler D; Alpers M P
CS Papua New Guinea Institute of Medical Research, Goroka and Maprik, Papua New Guinea.. blaise.genton@chuv.hospvd.ch
SO VACCINE, (2000 May 22) 18 (23) 2504-11.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT (CLINICAL TRIAL)
(CLINICAL TRIAL, PHASE I)

(CONTROLLED CLINICAL TRIAL)
Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200008
ED Entered STN: 20000901
Last Updated on STN: 20000901
Entered Medline: 20000824
AB A Phase I safety and immunogenicity study with a three-component blood-stage malaria **vaccine** was conducted in adult male subjects living in an endemic area of Papua New Guinea. The preparations were recombinant proteins which corresponded to parts of the two **merozoite surface proteins** of **Plasmodium falciparum** (MSP1 and 2), and of the ring-infected erythrocyte surface antigen (RESA). The three proteins were emulsified with the adjuvant Montanide ISA720. Ten subjects were injected twice (four weeks apart) with the **vaccine** formulation and two with the adjuvant alone. Mild pain at the site of injection was reported by about half of the subjects but no systemic reaction related to the formulation occurred. There was a sharp rise in geometric mean stimulation index after the second dose compared to baseline for MSP1 and RESA, while the rise was small for MSP2. Geometric mean antibody titres increased for MSP1 during the study, whereas they hardly changed for MSP2 and RESA. The **vaccine** formulation was safe when used in an already immune population. The **vaccine** induced good cellular responses, especially for MSP1 and RESA. Boosting of humoral responses was weak, probably because of high baseline antibody levels.

L16 ANSWER 66 OF 195 MEDLINE on STN
AN 2000187498 MEDLINE
DN 20187498 PubMed ID: 10722622
TI Immunogenicity and efficacy in aotus monkeys of four recombinant **Plasmodium falciparum vaccines** in multiple adjuvant formulations based on the 19-kilodalton C terminus of **merozoite surface protein** 1.
AU Kumar S; Collins W; Egan A; Yadava A; Garraud O; Blackman M J; Guevara Patino J A; Diggs C; Kaslow D C
CS Laboratory of Parasitic Diseases, National Institutes of Health, Bethesda, Maryland 20892, USA.. kumars@nmripo.nmri.nnmc.navy.mil
SO INFECTION AND IMMUNITY, (2000 Apr) 68 (4) 2215-23.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200004
ED Entered STN: 20000427
Last Updated on STN: 20000613
Entered Medline: 20000420
AB The immunogenicity and protective efficacy of four versions of recombinant C-terminal 19-kDa epidermal growth factor-like region of the major surface protein 1 (rMSP1(19)) of **Plasmodium falciparum** was studied in Aotus monkeys. Vaccination with each of the four rMSP1(19) constructs elicited high levels of antibodies to MSP1(19) but only one construct, the 19-kDa fragment expressed as a secreted fusion protein from Saccharomyces cerevisiae (yP30P2MSP1(19)), induced a high degree of protective immunity in Aotus nancymai against lethal P. falciparum challenge. Protective formulation required Freund's adjuvant; vaccination with yP30P2MSP1(19) in six other adjuvants that are suitable for human use induced lower levels of antibody response and no protection. These results emphasize the need to continue the search for an adjuvant that is comparable to Freund's adjuvant in potency and is safe for use in humans.

L16 ANSWER 67 OF 195 MEDLINE on STN
AN 2000187483 MEDLINE
DN 20187483 PubMed ID: 10722607
TI Linkage of exogenous T-cell epitopes to the 19-kilodalton region of Plasmodium yoelii **merozoite surface protein** 1 (MSP1(19)) can enhance protective immunity against malaria and modulate the immunoglobulin subclass response to MSP1(19).
AU Ahlborg N; Ling I T; Holder A A; Riley E M
CS Institute of Cell, Animal and Population Biology, Edinburgh University, Edinburgh EH9 3JT, United Kingdom.
SO INFECTION AND IMMUNITY, (2000 Apr) 68 (4) 2102-9.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200004
ED Entered STN: 20000427
Last Updated on STN: 20000427
Entered Medline: 20000420
AB The degree of protection against Plasmodium yoelii asexual blood stages induced by immunization of mice with the 19-kDa region of **merozoite surface protein** 1 (MSP1(19)) is H-2 dependent. As a strategy to improve the protection, mouse strains with disparate H-2 haplotypes were immunized with glutathione S-transferase (GST)-MSP1(19) proteins including either a universal T-cell epitope from tetanus toxin (P2) or an I-A(k)-restricted T-cell epitope (P8) from **Plasmodium falciparum** Pf332. In H-2(k) mice which are poorly protected following immunization with GST-MSP1(19), GST-P2-MSP1(19) significantly improved the protection. In mice partially (H-2(k/b)) or well protected by GST-MSP1(19) (H-2(d) and H-2(b)), P2 did not further increase the protection. However, the protection of H-2(k/b) mice and to some extent H-2(k) mice was improved by immunization with GST-P8-MSP1(19). The magnitudes of immunoglobulin G1 (IgG1) and IgG2a responses in mice immunized with the GST-MSP1(19) variants correlated with low peak parasitemia, indicating a protective capacity of these IgG subclasses. In H-2(k) mice immunized with GST-P2-MSP1(19), both IgG1 and IgG2a responses were significantly enhanced. The epitope P2 appeared to have a general ability to modulate the IgG subclass response since all four mouse strains displayed elevated IgG2a and/or IgG2b levels after immunization with GST-P2-MSP1(19). In contrast, GST-P8-MSP1(19) induced a slight enhancement of IgG responses in H-2(k/b) and H-2(k) mice without any major shift in IgG subclass patterns. The ability to improve the protective immunity elicited by P. yoelii MSP1(19) may have implications for improvement of human **vaccines** based on P. falciparum MSP1(19).

L16 ANSWER 68 OF 195 MEDLINE on STN
AN 2000283745 MEDLINE
DN 20283745 PubMed ID: 10823777
TI Anti-**merozoite surface protein**-1 19-kDa IgG in mother-infant pairs naturally exposed to **Plasmodium falciparum**: subclass analysis with age, exposure to asexual parasitemia, and protection against malaria. V. The Asembo Bay Cohort Project.
AU Branch O H; Oloo A J; Nahlen B L; Kaslow D; Lal A A
CS Division of Parasitic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia 30341-3717, USA.
SO JOURNAL OF INFECTIOUS DISEASES, (2000 May) 181 (5) 1746-52.
Journal code: 0413675. ISSN: 0022-1899.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English

FS Abridged Index Medicus Journals; Priority Journals
EM 200007
ED Entered STN: 20000728
Last Updated on STN: 20030105
Entered Medline: 20000720
AB The anti-**merozoite surface protein**-1 19-kDa IgG (anti-MSP119KD) IgG responses of 33 parasitemic infants, aged 6-14 months, were compared with those of their mothers at the time of the infant's delivery and at the time the infants were sampled; the antimalaria protection associated with these responses was also compared. IgG1 and IgG3 were the predominant subclasses. Infants <300 days old and pregnant mothers had the lowest cytophilic-to-noncytophilic IgG ratio. By 300 days of age, the infants had IgG subclass compositions and levels similar to those of their mothers at the same date. Among infants, older infants with only 1 or 2 detected asexual parasitemias had the highest cytophilic-to-noncytophilic IgG ratio and IgG1 levels. IgG1 level was negatively correlated with protection. The findings suggest that the MSP119KD antibody response develops with age, not with multiple experiences with parasitemia, and, thus, that an antimalaria **vaccine** strategy for pregnant mothers could delay infants' first parasitemias until they are more capable of mounting a favorable anti-MSP119KD response.

L16 ANSWER 69 OF 195 MEDLINE on STN
AN 2000143754 MEDLINE
DN 20143754 PubMed ID: 10678955
TI **Vaccine** efficacy of recombinant **Plasmodium falciparum merozoite surface protein** 1 in malaria-naive, -exposed, and/or -rechallenged Aotus vociferans monkeys.
AU Egan A F; Blackman M J; Kaslow D C
CS Malaria Vaccines Section, Malaria Vaccine Development Unit, Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland 20892, USA.
SO INFECTION AND IMMUNITY, (2000 Mar) 68 (3) 1418-27.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200003
ED Entered STN: 20000327
Last Updated on STN: 20000327
Entered Medline: 20000316
AB Protection against a lethal challenge infection of **Plasmodium falciparum** was elicited in malaria-naive Aotus vociferans monkeys by vaccination with the C terminus 19-kDa protein of the major **merozoite surface protein** (**MSP**-1(19)) fused to tetanus toxoid universal T-cell epitopes P30 and P2. Three of four monkeys were protected against a 10(4)-parasite challenge. Four monkeys were challenged with 10(5) parasites; one self-cured the infection, two were protected against high parasitemia (<2%) but were treated for severe anemia (hematocrit of <25%), and the fourth was not protected. In this model system, anemia appears to be a manifestation of incomplete protection (prolonged low-level parasitemia). Enzyme-linked immunosorbent assay (ELISA) antibody titers correlated with protection. Antibodies from some protected monkeys inhibited secondary processing of **MSP**-1(42) to **MSP**-1(33) and **MSP**-1(19). To mimic the repeated reinfections seen in regions where malaria is endemic, a second malaria parasite challenge was administered 4 months later. All P30P2MSP-1(19)-vaccinated monkeys were protected; thus, a single challenge infection may underestimate **vaccine** efficacy. ELISA antibody titers correlated with protection against a second infection but had

decreased compared to the first challenge. As most target populations for asexual blood-stage malaria **vaccines** will have been exposed to malaria parasites, a malaria parasite-exposed monkey was vaccinated with P30P2MSP-1(19). This monkey was completely protected, while a malaria parasite-naive P30P2MSP-1(19)-vaccinated monkey self-cured a low-grade parasitemia. Prior malaria parasite infection primed the production of anti-native **MSP**-1(19) antibodies, which were boosted by vaccination with recombinant P30P2MSP-1(19). Preliminary data suggest that immunogenicity studies of **vaccines** designed for malaria parasite-exposed populations should also be conducted in malaria parasite-exposed subjects.

L16 ANSWER 70 OF 195 MEDLINE on STN
AN 2001112990 MEDLINE
DN 20567978 PubMed ID: 11115704
TI Differences in epitope recognition, isotype and titer of antisera to **Plasmodium falciparum merozoite surface protein** 4 raised by different modes of DNA or protein immunization.
AU Wang L; Menting J G; Black C G; Stowers A; Kaslow D C; Hoffman S L; Coppel R L
CS Department of Microbiology, Monash University, Vic., 3800, Clayton, Australia.
NC DK32094 (NIDDK)
SO VACCINE, (2000 Nov 22) 19 (7-8) 816-24.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200102
ED Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20010208
AB **Plasmodium falciparum merozoite surface protein** 4 (MSP4) is being developed as a component of a subunit **vaccine** against asexual stages of malaria. Three DNA constructs were produced that induced expression of MSP4 either in the cytoplasm of transfected cells or secreted from cells under the control of the human tissue plasminogen activator (TPA) signal or the native P. falciparum MSP4 signal. Only the construct containing the TPA signal induced detectable antibodies in mice, although gene expression was demonstrated in all constructs and MSP4 was shown to be secreted using either signal by in vitro transient transfection of COS cells. Two recombinant MSP4 proteins that encoded the same sequence as the plasmid DNA were produced in E. coli (EcMSP4-His) and S. cerevisiae (yMSP4-His) and used to raise antibodies in mice. Comparison of the antibodies elicited by these various antigen formulations showed differences in titer, isotype and epitope recognition. The titer of antibodies induced by DNA vaccination was lower than that induced by yMSP4-His, which in turn was lower than that induced by EcMSP4-His. The isotype profiles of the antibodies were also different, the plasmid DNA induced predominantly IgG(2a) responses whereas the two proteins induced predominantly IgG(1) responses. The antibodies induced by DNA and yMSP4-His recognized predominantly the C-terminal epidermal growth factor (EGF)-like domain of the protein, whereas EcMSP4-His induced antibodies recognizing all domains of the protein equally. The antibodies induced by DNA vaccination were directed almost extensively to conformational epitopes so that reactivity with native MSP4 was abolished after disulfide bonds in the protein were disrupted. Antibodies induced by recombinant proteins recognized linear epitopes as well and reactivity to native MSP4 was preserved after reduction and alkylation of parasite proteins.

L16 ANSWER 71 OF 195 MEDLINE on STN
AN 2002010330 MEDLINE
DN 21266274 PubMed ID: 11372377
TI Inducible expression of MSP1 gene of **Plasmodium falciparum** by a tetracycline controlled promoter in Salmonella typhi CVD908 strain.
AU Qian F; Pan W
CS Department of Etiological Biology, Second Military Medical University, Shanghai 200433, China.
SO CHUNG-HUA I HSUEH TSA CHIH [CHINESE MEDICAL JOURNAL], (2000 Oct) 80 (10) 780-3.
Journal code: 7511141. ISSN: 0376-2491.
CY China
DT Journal; Article; (JOURNAL ARTICLE)
LA Chinese
FS Priority Journals
EM 200210
ED Entered STN: 20020121
Last Updated on STN: 20021002
Entered Medline: 20021001
AB OBJECTIVE: To investigate the inducible expression of MSP1 gene of **Plasmodium falciparum** in Salmonella typhi CVD908 **vaccine** strain using a tetracycline-controlled PLtetO promoter. METHODS: The recombinant plasmid pZE11/**MSP1-42** was transferred into the CVD908/tetR strain by electroporation. Detections of the expression of **MSP1-42** both in vitro and in vivo were carried out using SDS-PAGE, Western blot and immunofluorescence assay. RESULTS: The CVD908/tetR/**MSP1-42** strain was constructed and the expression of **MSP1-42** was dependent on the presence of tetracycline in vitro. The yield of the inducible expression was higher than that of constitutive system. Moreover, the **MSP1-42** was expressed in the liver and spleen of mice inoculated with the CVD908/tetR/**MSP1-42** strain in the presence of tetracycline, whereas no expression was detected in the absence of the inducer. CONCLUSION: The recombinant Salmonella typhi strain which expresses the **MSP1-42** fragment of **Plasmodium falciparum** induced by tetracycline has been established successfully.

L16 ANSWER 72 OF 195 MEDLINE on STN
AN 2001105404 MEDLINE
DN 21018443 PubMed ID: 11144809
TI Temporal and spatial distribution of the variants of **merozoite surface protein**-1 (**MSP**-1) in **Plasmodium falciparum** populations in Brazil.
AU Silva N S; Silveira L A; Machado R L; Povoa M M; Ferreira M U
CS Laboratorio de Parasitologia Molecular, Departamento de Doencas Infecciosas e Parasitarias, Faculdade de Medicina e Enfermagem de Sao Jose do Rio Preto, Sao Jose do Rio Preto, SP, Brazil.
SO ANNALS OF TROPICAL MEDICINE AND PARASITOLOGY, (2000 Oct) 94 (7) 675-88.
Journal code: 2985178R. ISSN: 0003-4983.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200102
ED Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20010208
AB The polymorphic, **merozoite surface protein**-1 (**MSP**-1) of **Plasmodium falciparum**, an antigen of the parasite's asexual blood-stages, is a major malaria-**vaccine** candidate. Nucleotide sequences of each variable domain or block of this

antigen may be grouped into one of three possible allelic types (K1, MAD20 and RO33), and 24 major types of the **msp**-1 gene may be defined, as unique combinations of allelic types in these variable blocks. Isolates collected from the Brazilian Amazon, over a period of 14 years, have now been investigated, by PCR-based typing of the **msp**-1 gene. Thirteen of the 24 possible gene-types were identified, and 336 P. falciparum clones were fully typed among 239 isolates. Most parasites (87%) belonged to one of the seven most frequent gene-types. Marked temporal variation in the distribution of **msp**-1 variants was found when comparing parasites sampled in the same sites at intervals of at least 5 years. Spatial variations were also found when comparing parasites from both neighbouring and distant sites within the Amazon Basin. The between-population variance in the frequencies of **msp** -1 allelic types found in Brazil, as estimated by Wright's FST statistic, is of similar magnitude to that found in previous world-wide comparisons. The potential implications of these findings for the development of an **MSP**-1-based, multivalent malaria **vaccine** are discussed.

L16 ANSWER 73 OF 195 MEDLINE on STN
AN 2000472515 MEDLINE
DN 20330078 PubMed ID: 10869334
TI Assessment of different sources of variation in the antibody responses to specific malaria antigens in children in Papua New Guinea.
AU Stirnadel H A; Al-Yaman F; Genton B; Alpers M P; Smith T A
CS Swiss Tropical Institute, Basel, Switzerland.. heide.stirnadel@roche.com
SO INTERNATIONAL JOURNAL OF EPIDEMIOLOGY, (2000 Jun) 29 (3) 579-86.
Journal code: 7802871. ISSN: 0300-5771.
Report No.: PIP-151288; POP-00296329.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals; Population
EM 200010
ED Entered STN: 20001012
Last Updated on STN: 20021101
Entered Medline: 20001004
AB BACKGROUND: A potential problem for malaria **vaccine** development and testing is between-host variation in antibody responses to specific malaria antigens. Previous work in adults in an area highly endemic for **Plasmodium falciparum** in Papua New Guinea found that genetic regulation partly explained heterogeneity in responsiveness. We have now assessed the relative contributions of environmental and genetic factors in total IgG responses to specific malaria antigens in children, and quantified temporal variation within individuals of total IgG responses. METHODS: Total IgG responses against schizont extract, **merozoite surface protein**-1, **merozoite surface protein**-2, ring-infected erythrocyte surface antigen, and SPf66 were measured by ELISA. Variance component analysis was used to estimate the variation explained by genetic and environmental factors in these antibody responses. Intra- and inter-class correlations of antibody responses within relative pairs were estimated. We adjusted for age, P. falciparum density, sex and village differences either within or prior to the analysis. RESULTS: For all malaria antigens, temporal variation in the total IgG response was the predominant source of variation. There was substantial familial aggregation of all IgG responses, but it remained unclear how much this clustering was attributable to genetic factors and how much to a common environment in the household. The remaining variance, which could not be explained by either of the above, was very small for most of the antigens. CONCLUSIONS: Temporal variation and clustering of immune responses to specific malaria antigens need to be taken into account when planning, conducting and interpreting immuno-epidemiological and **vaccine** studies.

L16 ANSWER 74 OF 195 MEDLINE on STN
AN 2000414667 MEDLINE
DN 20290565 PubMed ID: 10832968
TI A simple screening method for detecting bindings between oligopeptides and HLA-DR molecules on filter papers: possible application for mapping of putative helper T-cell epitopes on MSP1 of **Plasmodium falciparum**.
AU Fu J; Hato M; Igarashi K; Suzuki T; Matsuoka H; Ishii A; Leafasia J L; Chinzei Y; Ohta N
CS Department of Medical Zoology, Faculty of Medicine, Mie University, Tsu, Japan.
SO MICROBIOLOGY AND IMMUNOLOGY, (2000) 44 (4) 249-57.
Journal code: 7703966. ISSN: 0385-5600.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200008
ED Entered STN: 20000907
Last Updated on STN: 20000907
Entered Medline: 20000831
AB Binding capacities of synthetic peptides to HLA-DR molecules were tested on filter papers to identify putative helper T-cell epitopes on a malarial protein. The antigen tested was the merozoite surface glycoprotein 1 (MSP1) of **Plasmodium falciparum**, a **vaccine** candidate targeting the asexual erythrocytic stage. Bindings between synthetic oligopeptides and HLA-DR molecules were tested. Such bindings were not non-specific, and a known helper T-cell epitope peptide showed positive binding to the restricting HLA-DR molecule. By using this screening system, we observed the unequal distribution of HLA-DR-binding peptides in 10 out of 17 MSP1 blocks tested. Block #6 of MSP1 seemed to show the highest frequency in the positive binding; on the other hand, blocks #1 and #17, both of which were thought to be **vaccine** candidate regions, contained fewer HLA-DR binding peptides. This was not inconsistent with the results that block #17 was less stimulatory to peripheral T cells than block #6. The peptides with positive binding to HLA-DR showed actual epitope activities when we tested peptide-driven proliferation of human bulk T-cell lines, and association between the two parameters was statistically significant ($P<0.001$). For more detailed information for **vaccine** development, peptides with both IgG- and HLA-DR binding activities were mapped in block #17 of MSP1. Together with these results, we demonstrate that our simple screening system seems to provide essential information for **vaccine** development through uncovering locations of putative epitopes for human helper T cells.

L16 ANSWER 75 OF 195 MEDLINE on STN
AN 2003057949 IN-PROCESS
DN 22455707 PubMed ID: 12567654
TI Inducible expression of MSP1 gene of **Plasmodium falciparum** by a tetracycline-controlled promoter.
AU Qian F; Pan W Q
CS Department of Etiological Biology, Second Military Medical University, Shanghai 200433.
SO CHUNG-KUO CHI SHENG CHUNG HSUEH YU CHI SHENG CHUNG PING TSA CHIH CHINESE JOURNAL OF PARASITOLOGY AND PARASITIC DISEASES, (2000) 18 (4) 193-6.
Journal code: 8709992. ISSN: 1000-7423.
CY China
DT Journal; Article; (JOURNAL ARTICLE)
LA Chinese
FS IN-PROCESS; NONINDEXED; Priority Journals
ED Entered STN: 20030206
Last Updated on STN: 20030206

AB OBJECTIVE: To express the entire MSP1 gene of **Plasmodium falciparum** and its C-terminal 42 kDa fragment using a tetracycline-controlled PLtetO-1 promoter. METHODS: The entire MSP1 gene and 42 kDa fragment gene were cloned into the plasmid of pZE11, and transformed into E. coli DH5 alpha Z1. Restriction enzyme analysis, SDS-PAGE and Western blotting were used to examine two recombinant plasmids and their expression in E. coli DH5 alpha Z1. RESULTS: The recombinant plasmids of pZE11/MSP1 and pZE11/**MSP1-42** were constructed successfully. The expressive products about 190 kDa and 42 kDa of two genes in E. coli DH5 alpha Z1 were identified by SDS-PAGE and Western blotting. CONCLUSION: Tightly controlling expression of the MSP1 gene in E. coli is essential to reduce the toxicity of the product to its host cells as well as to provide a feasibility to construct Salmonella **vaccine** strain which can inducibly express the important malarial **vaccine** candidate gene.

L16 ANSWER 76 OF 195 MEDLINE on STN
AN 2003329047 MEDLINE
DN 22742635 PubMed ID: 12858901
TI Human IgG subclass antibodies to the 19 kilodalton carboxy terminal fragment of **Plasmodium falciparum merozoite surface protein** 1 (MSP1(19)) and predominance of the MAD20 allelic type of MSP1 in Uganda.
AU Apio B; Nalunkuma A; Okello D; Riley E; Egwang T G
CS Med Biotech Laboratories, Kampala, Uganda.
SO EAST AFRICAN MEDICAL JOURNAL, (2000 Apr) 77 (4) 189-93.
Journal code: 0372766. ISSN: 0012-835X.
CY Kenya
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200307
ED Entered STN: 20030716
Last Updated on STN: 20030731
Entered Medline: 20030730
AB OBJECTIVE: To determine the natural human humoral immune responses to the 19 kilodalton carboxy terminal fragment of **Plasmodium falciparum merozoite surface protein** 1 (MSP1(19)), a malaria candidate **vaccine** antigen and to determine the prevalence of MAD20 and K1 alleles of P. falciparum MSP1. DESIGN: Community based cross-sectional study. SETTING: Atopi Parish, Apac District, Uganda, 1995. SUBJECTS: Three hundred and seventy four Ugandans between <1 and 70 years old provided serum samples. MAIN OUTCOME MEASURES: IgG subclass antibodies by ELISA; MAD20 and K1 allelic types of MSP1 by PCR. RESULTS: Both the prevalence and the mean concentration of serum IgG1, and to a lesser extent IgG3, antibodies increased with age. IgG2 or IgG4 antibodies were virtually nonexistent. The cross-reactivity between the 4 sequence variants (E-KNG, E-TSR, Q-KNG and Q-TSR) of MSP1(19) was confirmed; however, a minority of sera preferentially recognised the KNG but not the TSR variants. All 33 P. falciparum isolates from different parts of Uganda carried the E-TSR (Mad20) allelic type and 3 isolates were mixed infections with E-TSR (MAD20) and Q-KNG (K1) allelic types, confirming the rarity of the K1 allele in Uganda. CONCLUSION: There is a robust IgG1 antibody response to the malaria **vaccine** candidate antigen MSP1(19) which begins at an early age. Future cohort studies are necessary to estblish the impact of these antibodies on clinical immunity to malaria. The MAD20 allelic type of MSP1 id predominant in Ugandan P. falciparum isolates.

L16 ANSWER 77 OF 195 MEDLINE on STN
AN 2001043717 MEDLINE
DN 20457012 PubMed ID: 11000468
TI Construction and immunogenicity in mice of attenuated Salmonella typhi

expressing **Plasmodium falciparum merozoite surface protein** 1 (**MSP**-1) fused to tetanus toxin fragment C.

AU Wu S; Beier M; Sztein M B; Galen J; Pickett T; Holder A A; Gomez-Duarte O G; Levine M M

CS Center for Vaccine Development and the Division of Geographic Medicine, Department of Medicine, University of Maryland, School of Medicine, 685 West Baltimore Street, Baltimore, MD 21201, USA.

NC RO1AI29471 (NIAID)
RO1AI36525 (NIAID)
RO1AI40297 (NIAID)

SO JOURNAL OF BIOTECHNOLOGY, (2000 Sep 29) 83 (1-2) 125-35.
Journal code: 8411927. ISSN: 0168-1656.

CY Netherlands

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

EM 200012

ED Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20001204

AB One strategy to develop a multi-antigen malaria **vaccine** is to employ live vectors to carry putative protective **Plasmodium falciparum** antigens to the immune system. The 19 kDa carboxyl terminus of P. falciparum **merozoite surface protein** 1 (**MSP**-1), which is essential for erythrocyte invasion and is a leading antigen for inclusion in a multivalent malaria **vaccine**, was genetically fused to fragment C of tetanus toxin and expressed within attenuated Salmonella typhi CVD 908. Under conditions in the bacterial cytoplasm, the fragment C-**MSP**-1 fusion did not form the epidermal growth factor (EGF)-like domains of **MSP**-1; monoclonal antibodies failed to recognize these conformational domains in immunoblots of non-denatured protein extracted from live vector sonicates. The **MSP**-1 was nevertheless immunogenic. One month following intranasal immunization of BALB/c mice with the live vector construct, four out of five mice exhibited > or =four-fold rises in anti-**MSP**-1 by ELISA (GMT=211); a single intranasal booster raised titers further (GMT=1280). Post-immunization sera recognized native **MSP**-1 on merozoites as determined by indirect immunofluorescence. These data encourage efforts to optimize **MSP**-1 expression in S. typhi (e.g. as a secreted protein), so that the EGF-like epitopes, presumably necessary for stimulating protective antibodies, can form.

L16 ANSWER 78 OF 195 MEDLINE on STN

AN 2000497403 MEDLINE

DN 20416489 PubMed ID: 10960170

TI Intragenic recombination in the 3' portion of the **merozoite surface protein** 1 gene of Plasmodium vivax.

AU Putaporntip C; Jongwutiwes S; Seethamchai S; Kanbara H; Tanabe K

CS Department of Parasitology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand.

SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2000 Jul) 109 (2) 111-9.
Journal code: 8006324. ISSN: 0166-6851.

CY Netherlands

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

OS GENBANK-AF199393; GENBANK-AF199394; GENBANK-AF199395; GENBANK-AF199396; GENBANK-AF199397; GENBANK-AF199398; GENBANK-AF199399; GENBANK-AF199400; GENBANK-AF199401; GENBANK-AF199402; GENBANK-AF199403; GENBANK-AF199404; GENBANK-AF199405; GENBANK-AF199406; GENBANK-AF199407; GENBANK-AF199408; GENBANK-AF199409; GENBANK-AF199410

EM 200010

ED Entered STN: 20001027
Last Updated on STN: 20001027
Entered Medline: 20001019

AB To date, little has been known about the extent of sequence variation in the C-terminal part of the Plasmodium vivax **merozoite surface protein** 1 (PvMSP1) which has been considered to be a potential **vaccine** candidate. Here, we examined the variation in the region encompassing interspecies conserved blocks (ICBs) 8 and 10 of PvMSP1 by DNA sequencing of 14 Thai isolates and three Brazilian isolates. Eighteen different alleles were detected. Three new sequence types had been identified in polymorphic region between ICB8 and CB9: one was possibly a result of intragenic recombination between the Belem and Salvador I alleles and the others displayed unique repeats. A striking variation was observed in a stretch of 38 codons in polymorphic block between conserved block CB9 and ICB10, resulting in eight different sequence types, probably generated by interallelic recombination at a single or multiple sites. There is no apparent linkage between these two polymorphic sites. On the other hand, a single or stretches of nucleotide substitutions are dimorphic like in **Plasmodium falciparum** MSP1 (PfMSP1) in the remaining parts, creating microheterogeneity of sequences. The C-terminal 19 kDa-encoding region was extremely conserved with a single dimorphic exchange at a known position. Thus, this study provides evidence of intragenic recombination occurring in the 3' portion of PvMSP1 and suggests that the 3' portion of PvMSP1 is more diverse than that in PfMSP1.

L16 ANSWER 79 OF 195 MEDLINE on STN
AN 2000081030 MEDLINE
DN 20081030 PubMed ID: 10613831
TI Functional conservation of the malaria **vaccine** antigen **MSP**-119across distantly related Plasmodium species.
AU O'Donnell R A; Saul A; Cowman A F; Crabb B S
CS Department of Microbiology, The University of Melbourne, Parkville, Victoria 3052, Australia.
SO NATURE MEDICINE, (2000 Jan) 6 (1) 91-5.
Journal code: 9502015. ISSN: 1078-8956.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200002
ED Entered STN: 20000218
Last Updated on STN: 20000218
Entered Medline: 20000209

AB The C-terminal region of **Plasmodium falciparum merozoite surface protein** 1 (**MSP** -119) is at present a leading malaria **vaccine** candidate. Antibodies against the epidermal growth factor-like domains of **MSP** -1 19are associated with immunity to P. falciparum and active immunization with recombinant forms of the molecule protect against malaria challenge in various experimental systems. These findings, with the knowledge that epidermal growth factor-like domains in other molecules have essential binding functions, indicate the importance of this protein in merozoite invasion of red blood cells. Despite extensive molecular epidemiological investigations, only limited sequence polymorphism has been identified in P. falciparum **MSP**-119 (refs. 9-11). This indicates its sequence is functionally constrained, and is used in support of the use of **MSP**-119 as a **vaccine**. Here, we have successfully complemented the function of most of P. falciparum **MSP**-119 with the corresponding but highly divergent sequence from the rodent parasite P. chabaudi. The results indicate that the role of **MSP**-119 in red blood cell invasion is conserved across distantly related Plasmodium species and show that the sequence of P. falciparum **MSP**-119 is

not constrained by function.

L16 ANSWER 80 OF 195 MEDLINE on STN
AN 2000388619 MEDLINE
DN 20264027 PubMed ID: 10802320
TI Identification of a novel antigenic domain of **Plasmodium falciparum merozoite surface protein** -1 that specifically binds to human erythrocytes and inhibits parasite invasion, in vitro.
AU Nikodem D; Davidson E
CS Department of Biochemistry and Molecular Biology, Georgetown University Medical Center, Washington, DC, USA.
NC AI41139 (NIAID)
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2000 Apr 30) 108 (1) 79-91. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200008
ED Entered STN: 20000818
Last Updated on STN: 20000818
Entered Medline: 20000810
AB **Merozoite surface protein** 1 (**MSP** -1) of **Plasmodium falciparum** is a promising candidate for **vaccine** development against malaria. Identification of protective epitopes within **MSP**-1 is an important step towards the elucidation of mechanisms of parasitic invasion and for the creation of a multi-subunit **vaccine**. In this study, we show that a 115 amino acid region (p115MSP-1) within the p38 domain of **MSP**-1 can: (i) specifically bind to human erythrocytes, independent of glycophorin A; (ii) inhibit parasite invasion at significant levels, in vitro; and (iii) be recognized by human sera of individuals from malaria-endemic regions of Africa. More importantly, we also show that polyclonal antibodies specific to this region prevent parasite invasion at levels approaching 90%, in vitro. Our data illustrate that not only is p115MSP-1 involved in parasite recognition/invasion of human erythrocytes, but that this region is highly antigenic, producing high titer antibodies. The delineation of the role of **MSP**-1 in parasite invasion is an important component of the development of a multi-subunit malaria **vaccine**, and this study identifies a candidate antigen in this context.

L16 ANSWER 81 OF 195 MEDLINE on STN
AN 2000174568 MEDLINE
DN 20174568 PubMed ID: 10711426
TI Processing and localisation of a GPI-anchored **Plasmodium falciparum** surface protein expressed by the baculovirus system.
AU Kedees M H; Gerold P; Azzouz N; Blaschke T; Shams-Eldin H; Muhlberger E; Holder A A; Klenk H D; Schwarz R T; Eckert V
CS Zentrum fur Hygiene und Medizinische Mikrobiologie, Philips-Universitat Marburg, Germany.
SO EUROPEAN JOURNAL OF CELL BIOLOGY, (2000 Jan) 79 (1) 52-61. Journal code: 7906240. ISSN: 0171-9335.
CY GERMANY: Germany, Federal Republic of
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200005
ED Entered STN: 20000606
Last Updated on STN: 20000606
Entered Medline: 20000522
AB We describe the expression, in insect cells using the baculovirus system,

of two protein fragments derived from the C-terminus of **merozoite surface protein** 1(**MSP**-1) of the human malaria parasite **Plasmodium falciparum**, and their glycosylation and intracellular location. The transport and intracellular localisation of the intact C-terminal **MSP**-1 fragment, modified by addition of a signal sequence for secretion, was compared with that of a similar control protein in which translation of the GPI-cleavage/attachment site was abolished by insertion of a stop codon into the DNA sequence. Both proteins could only be detected intracellularly, most likely in the endoplasmic reticulum. This lack of transport to the cell surface or beyond, was confirmed for both proteins by immunofluorescence with a specific antibody and characterisation of their N-glycans. The N-glycans had not been processed by enzymes localised in post-endoplasmic reticulum compartments. In contrast to **MSP**-1, the surface antigen SAG-1 of Toxoplasma gondii was efficiently transported out of the endoplasmic reticulum of insect cells and was located, at least in part, on the cell surface. No GPI-anchor could be detected for either of the **MSP**-1 constructs or SAG-1, showing that the difference in transport is a property of the individual proteins and cannot be attributed to the lack of a GPI-anchor. The different intracellular location and post-translational modification of recombinant proteins expressed in insect cells, as compared to the native proteins expressed in parasites, and the possible implications for **vaccine** development are discussed.

L16 ANSWER 82 OF 195 MEDLINE on STN
AN 2000106724 MEDLINE
DN 20106724 PubMed ID: 10643908
TI Sequence diversity of the **merozoite surface protein** 1 of **Plasmodium falciparum** in clinical isolates from the Kilombero District, Tanzania.
AU Jiang G; Daubenberger C; Huber W; Matile H; Tanner M; Pluschke G
CS Swiss Tropical Institute, Basel.
SO ACTA TROPICA, (2000 Jan 5) 74 (1) 51-61.
Journal code: 0370374. ISSN: 0001-706X.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF061119; GENBANK-AF061120; GENBANK-AF061121; GENBANK-AF061122; GENBANK-AF061123; GENBANK-AF061124; GENBANK-AF061125; GENBANK-AF061126; GENBANK-AF061127; GENBANK-AF061128; GENBANK-AF061129; GENBANK-AF061130; GENBANK-AF061131; GENBANK-AF061132; GENBANK-AF061133; GENBANK-AF061134; GENBANK-AF061135; GENBANK-AF061136; GENBANK-AF061137; GENBANK-AF061138; GENBANK-AF061139; GENBANK-AF061140; GENBANK-AF061141; GENBANK-AF061148; GENBANK-AF061149; GENBANK-AF061150; GENBANK-AF061151
EM 200002
ED Entered STN: 20000229
Last Updated on STN: 20000229
Entered Medline: 20000216
AB **Merozoite surface protein** 1 of **Plasmodium falciparum** (PfMSP-1) is regarded as a key candidate antigen for malaria **vaccine** development. It exhibits significant antigenic polymorphism and has been divided into 17 building blocks based on the analysis of sequence diversity. Differences in the antigenic composition of PfMSP-1 in local P. falciparum populations may result in differences in the efficacy of **vaccines**, which contain sequences of particular allelic variant(s) of PfMSP-1. To contribute to the required knowledge of genetic diversity of malaria parasites in geographically diverse regions, we have used the polymerase chain reaction (PCR) to analyze the sequence diversity of blocks 1-4 of PfMSP-1 in disease isolates from the Kilombero District in Tanzania. In the semi-conserved block 1, in which dimorphic amino acid variances have been

described at three positions, we found three of the five previously described combinations of these three pairs of amino acids. In addition one combination was found, which has not been reported before in parasite isolates from different locations worldwide. Of the two sequence variants, which were dominating, one (S44-Q47-V52) corresponded to the 83.1 sequence incorporated into the SPf66 malaria peptide **vaccine** , while the other one (G44-H47-I52) differed from the previous in all three dimorphic amino acids. The partial protection observed in a phase III SPf66 trial conducted in the Kilombero District in children aged 1-5, thus does not seem to be associated with a clear dominance of favourable variants of block 1 of PfMSP-1 in this area. All three different principle types of block 2, the major polymorphic region of PfMSP-1, were found in the Tanzanian isolates. Most of the sequences contained K1-type tripeptide repeats, but clones with MAD20-type repeats or no repetitive sequence (RO33-type block 2) were also present. K1- and MAD20-type tripeptide repeat motifs were never mixed within one parasite clone. In one sequence a hexapeptide repeat was found at the end of block 2, which has not been reported before. Dimorphism in 13 of the 17 previously described variable positions of the semi-conserved block 3 and three of four recombination types of block 4 (K/K, M/K and M/M) were found among the Tanzanian isolates. Apart from previously described dimorphic amino acid positions, polymorphism was rare in the non-repeated building blocks. Selection and spreading of parasite variants, which contain amino acid exchanges at other than the dimorphic positions thus, is not a common event. Parasite isolates frequently harboured more than one PfMSP-1 allele. Three of the four heterogeneous isolates analysed contained two different general types of sequences. One isolate contained at least four distinct clones, demonstrating the high endemicity of malaria in the Kilombero District, which is a well-established site for malaria **vaccine** field trials.

L16 ANSWER 83 OF 195 MEDLINE on STN
AN 2000002573 MEDLINE
DN 20002573 PubMed ID: 10531247
TI Allelic diversity and antibody recognition of **Plasmodium falciparum merozoite surface protein** 1 during hypoendemic malaria transmission in the Brazilian amazon region.
AU Da Silveira L A; Dorta M L; Kimura E A; Katzin A M; Kawamoto F; Tanabe K; Ferreira M U
CS Department of Parasitology, Institute for Biomedical Sciences, University of Sao Paulo, Sao Paulo, Brazil.
SO INFECTION AND IMMUNITY, (1999 Nov) 67 (11) 5906-16.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199911
ED Entered STN: 20000111
Last Updated on STN: 20000111
Entered Medline: 19991116
AB The polymorphic **merozoite surface protein** (**MSP**-1) of **Plasmodium falciparum** is a major asexual blood-stage malaria **vaccine** candidate. The impact of allelic diversity on recognition of **MSP**-1 during the immune response remains to be investigated in areas of hypoendemicity such as the Brazilian Amazon region. In this study, PCR was used to type variable regions, blocks 2, 4, and 10, of the **msp**-1 gene and to characterize major gene types (unique combinations of allelic types in variable blocks) in P. falciparum isolates collected across the Amazon basin over a period of 12 years. Twelve of the 24 possible gene types were found among 181 isolates, and 68 (38%) of them had more than one gene type. Temporal, but not spatial, variation was found in the distribution

of **MSP**-1 gene types in the Amazon. Interestingly, some gene types occurred more frequently than expected from random assortment of allelic types in different blocks, as previously found in other areas of endemicity. We also compared the antibody recognition of polymorphic (block 2), dimorphic (block 6), and conserved (block 3) regions of **MSP**-1 in Amazonian malaria patients and clinically immune Africans, using a panel of recombinant peptides. Results were summarized as follows. (i) All blocks were targeted by naturally acquired cytophilic antibodies of the subclasses IgG1 and IgG3, but the balance between IgG1 and IgG3 depended on the subjects' cumulative exposure to malaria. (ii) The balance between IgG1 and IgG3 subclasses and the duration of antibody responses differed in relation to distinct **MSP**-1 peptides. (iii) Antibody responses to variable blocks 2 and 6 were predominantly type specific, but variant-specific antibodies that target isolate-specific repetitive motifs within block 2 were more frequent in Amazonian patients than in previously studied African populations.

L16 ANSWER 84 OF 195 MEDLINE on STN
AN 2000002555 MEDLINE
DN 20002555 PubMed ID: 10531229
TI **Plasmodium falciparum** field isolates commonly use erythrocyte invasion pathways that are independent of sialic acid residues of glycophorin A.
AU Okoyeh J N; Pillai C R; Chitnis C E
CS Malaria Group, International Centre for Genetic Engineering and Biotechnology, New Delhi, India.
SO INFECTION AND IMMUNITY, (1999 Nov) 67 (11) 5784-91.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199911
ED Entered STN: 20000111
Last Updated on STN: 20000111
Entered Medline: 19991116
AB Erythrocyte invasion by malaria parasites is mediated by specific molecular interactions. Sialic acid residues of glycophorin A are used as invasion receptors by **Plasmodium falciparum**. In vitro invasion studies have demonstrated that some cloned P. falciparum lines can use alternate receptors independent of sialic acid residues of glycophorin A. It is not known if invasion by alternate pathways occurs commonly in the field. In this study, we used in vitro growth assays and erythrocyte invasion assays to determine the invasion phenotypes of 15 P. falciparum field isolates. Of the 15 field isolates tested, 5 multiply in both neuraminidase and trypsin-treated erythrocytes, 3 multiply in neuraminidase-treated but not trypsin-treated erythrocytes, and 4 multiply in trypsin-treated but not neuraminidase-treated erythrocytes; 12 of the 15 field isolates tested use alternate invasion pathways that are not dependent on sialic acid residues of glycophorin A. Alternate invasion pathways are thus commonly used by P. falciparum field isolates. Typing based on two polymorphic markers, **MSP**-1 and **MSP**-2, and two microsatellite markers suggests that only 1 of the 15 field isolates tested contains multiple parasite genotypes. Individual P. falciparum lines can thus use multiple invasion pathways in the field. These observations have important implications for malaria **vaccine** development efforts based on EBA-175, the P. falciparum protein that binds sialic acid residues of glycophorin A during invasion. It may be necessary to target parasite ligands responsible for the alternate invasion pathways in addition to EBA-175 to effectively block erythrocyte invasion by P. falciparum.

L16 ANSWER 85 OF 195 MEDLINE on STN

AN 1999389347 MEDLINE
DN 99389347 PubMed ID: 10462251
TI Human phase I **vaccine** trials of 3 recombinant asexual stage malaria antigens with Montanide ISA720 adjuvant.
AU Saul A; Lawrence G; Smillie A; Rzepczyk C M; Reed C; Taylor D; Anderson K; Stowers A; Kemp R; Allworth A; Anders R F; Brown G V; Pye D; Schoofs P; Irving D O; Dyer S L; Woodrow G C; Briggs W R; Reber R; Sturchler D
CS CRC for Vaccine Technology and Australian Centre for International and Tropical Health and Nutrition, The Queensland Institute of Medical Research, Royal Brisbane Hospital, Australia.. allans@qimr.edu.au
SO VACCINE, (1999 Aug 6) 17 (23-24) 3145-59.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT (CLINICAL TRIAL)
(CLINICAL TRIAL, PHASE I)
Journal; Article; (JOURNAL ARTICLE)
(RANDOMIZED CONTROLLED TRIAL)
LA English
FS Priority Journals
EM 199912
ED Entered STN: 20000113
Last Updated on STN: 20000113
Entered Medline: 19991216
AB Two phase I **vaccine** trials were conducted to test the immunogenicity and safety of a **vaccine** containing three recombinant malaria antigens from the asexual stage of **Plasmodium falciparum**. The three antigens are a fragment of MSP1 (190LCS.T3); MSP2 and a portion of RESA and were formulated in Montanide ISA720 adjuvant. These trials investigated the dose response of each antigen for eliciting both antibody and T-cell responses and the immunogenicity of a mixture of the antigens compared with the antigens injected separately. All three antigens elicited both antibody and T-cell responses. Strong T-cell responses were observed with 190LCS.T3 and RESA with stimulation indices exceeding 100 for peripheral blood leucocytes in some individuals. The antibody responses were generally weak. The human antibody responses observed with MSP2 in Montanide ISA720 were not significantly different from those obtained in an earlier trial which used MSP2 with alum as the adjuvant. No antigenic competition was observed: volunteers receiving a mixture of antigens had similar responses to those receiving the three antigens at separate sites. Tenderness and pain at the injection site were common over the first few days following immunization. In some volunteers, especially those receiving the highest doses tested, there was a delayed reaction at the injection site with pain and swelling occurring approximately 10 days after injection.

L16 ANSWER 86 OF 195 MEDLINE on STN
AN 1999242790 MEDLINE
DN 99242790 PubMed ID: 10225865
TI Levels of antibody to conserved parts of **Plasmodium falciparum merozoite surface protein** 1 in Ghanaian children are not associated with protection from clinical malaria.
AU Dodoo D; Theander T G; Kurtzhals J A; Koram K; Riley E; Akanmori B D; Nkrumah F K; Hviid L
CS Noguchi Memorial Institute for Medical Research, University of Ghana, Legon, Ghana.
SO INFECTION AND IMMUNITY, (1999 May) 67 (5) 2131-7.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199905

ED Entered STN: 19990601
Last Updated on STN: 19990601
Entered Medline: 19990518

AB The 19-kDa conserved C-terminal part of the **Plasmodium falciparum merozoite surface protein** 1 (PfMSP119) is a malaria **vaccine** candidate antigen, and human antibody responses to PfMSP119 have been associated with protection against clinical malaria. In this longitudinal study carried out in an area of stable but seasonal malaria transmission with an estimated parasite inoculation of about 20 infective bites/year, we monitored 266 3- to 15-year-old Ghanaian children clinically and parasitologically over a period of 18 months. Blood samples were collected at the beginning of the study before the major malaria season in April and after the season in November. Using enzyme-linked immunosorbent assay, we measured antibody responses to recombinant gluthathione S-transferase-PfMSP119 fusion proteins corresponding to the Wellcome and MAD20 allelic variants in these samples. Prevalence of antibodies recognizing the Wellcome 19 construct containing both epidermal growth factor (EGF)-like motifs in Wellcome type PfMSP119 was about 30%. Prevalence of antibodies to constructs containing only the first EGF domain from either Wellcome or MAD20 type PfMSP119 was about 15%, whereas antibodies recognizing a construct containing only the second EGF domain of MAD20 type PfMSP119 was found in only about 4% of the donors. Neither the prevalence nor the levels of any of the antibody specificities varied significantly with season, age, or sex. Significantly, and in contrast to previous reports from other parts of West Africa, we found no evidence of an association between antibody responses to PfMSP119 and clinical protection against malaria.

L16 ANSWER 87 OF 195 MEDLINE on STN
AN 1999128299 MEDLINE
DN 99128299 PubMed ID: 9927744
TI **Vaccine** candidate **MSP**-1 from **Plasmodium falciparum**: a redesigned 4917 bp polynucleotide enables synthesis and isolation of full-length protein from Escherichia coli and mammalian cells.
AU Pan W; Ravot E; Tolle R; Frank R; Mosbach R; Turbachova I; Bujard H
CS ZMBH, Universitat Heidelberg, Im Neuenheimer Feld 282, D-69120 Heidelberg, Germany.
SO NUCLEIC ACIDS RESEARCH, (1999 Feb 15) 27 (4) 1094-103.
Journal code: 0411011. ISSN: 0305-1048.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AJ131294
EM 199904
ED Entered STN: 19990426
Last Updated on STN: 19990426
Entered Medline: 19990413

AB The **Plasmodium falciparum** malaria parasite is the causative agent of malaria tropica. Merozoites, one of the extracellular developmental stages of this parasite, expose at their surface the **merozoite surface protein**-1 complex (**MSP**-1), which results from the proteolytic processing of a 190-200 kDa precursor. **MSP**-1 is highly immunogenic in humans and numerous studies suggest that this protein is an effective target for a protective immune response. Although its function is unknown, there are indications that it may play a role during invasion of erythrocytes by merozoites. The parasite-derived **msp**-1 gene, which is approximately 5000 bp long, contains 74% AT. This high AT content has prevented stable cloning of the full-size gene in Escherichia coli and consequently its expression in heterologous systems. Here, we describe the synthesis of a 4917 bp gene encoding **MSP**-1 from the FCB-1

strain of P. falciparum adjusted for human codon preferences. The synthetic **msp**-1 gene (55% AT) was cloned, maintained and expressed in its entirety in E.coli as well as in CHO and HeLa cells. The purified protein is soluble and appears to possess native conformation because it reacts with a panel of mAbs specific for conformational epitopes. The strategy we used for synthesizing the full-length **msp**-1 gene was toassemble it from DNA fragments encoding all of the major proteolytic fragments normally generated at the parasite's surface. Thus, after subcloning we also obtained each of these **MSP**-1 processing products as hexahistidine fusion proteins in E.coli and isolated them by affinity chromatography on Ni2+agarose. The availability of defined preparations of **MSP**-1 and its major processing products open up new possibilities for in-depth studies at the structural and functional level of this important protein, including the exploration of **MSP**-1-based experimental **vaccines**.

L16 ANSWER 88 OF 195 MEDLINE on STN
AN 2000048117 MEDLINE
DN 20048117 PubMed ID: 10580206
TI Mice immunised with synthetic peptide from N-terminal conserved region of merozoite surface antigen-2 of human malaria parasite **Plasmodium falciparum** can control infection induced by Plasmodium yoelii yoelii 265BY strain.
AU Lougovskoi A A; Okoyeh N J; Chauhan V S
CS International Centre for Genetic Engineering and Biotechnology, PO Box 10504, Aruna Asaf Ali Marg, New Delhi, India.. louugovsk@casse.elcom.ru
SO VACCINE, (1999 Dec 10) 18 (9-10) 920-30.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200001
ED Entered STN: 20000131
Last Updated on STN: 20000131
Entered Medline: 20000118
AB Synthetic peptides representing conserved MSA-2 sequences are being considered as a possible component of a blood stage malaria **vaccine**. Antibody response towards the entire N-terminal conserved region of MSA-2 and its constituent B-epitope SNTFINNA following immunisation of BALB/c and C57BL/6 mice with different peptide constructs was assessed by ELISA and immunofluorescence antibody test (IFAT). Co-linear synthesis of SNTFINNA-epitope in tandem with the entire N-terminal conserved region peptide (P23) made this construct, namely P8.P23, to be highly immunogenic in both mouse strains, with the antibody response to the SNTFINNA epitope comparable to that following tetanus toxoid protein conjugate immunisation. The antibodies raised specifically recognised the schizont stages of **Plasmodium falciparum** and Plasmodium yoelii. There was no protection observed upon challenge of immunised BALB/c and C57BL/6 mice with the highly lethal Plasmodium yoelii nigeriensis strain. On the contrary, BALB/c mice immunised with P8.P23 construct were able to resist blood stage infection induced by Plasmodium yoelii yoelii 265BY parasites, while animals inoculated with P23 did not control infection. Affinity purified rabbit anti-SNTFINNA IgG showed more than 60% inhibition of merozoite invasion of fresh erythrocytes in in vitro P. falciparum culture. The low prevalence of antibody response to SNTFINNA-epitope, tested in a dot-blot assay, was observed in sera of 80 individuals living in malaria endemic area in a India; the phenomenon may point out the cryptic character of epitopes residing at the N-terminal conserved region of MSA-2.

L16 ANSWER 89 OF 195 MEDLINE on STN
AN 2001554555 MEDLINE

DN 21487698 PubMed ID: 11601273
TI A recombinant multi-epitope, multi-stage malaria **vaccine** candidate expressed in Escherichia coli.
AU Li M; Bi H; Dong W; Xu W; Li Q; Li Y
CS Institute of Tropical Medicine, First Military Medical University, Guangzhou, 510515, China.
SO CHINESE MEDICAL JOURNAL, (1999 Aug) 112 (8) 691-7.
Journal code: 7513795. ISSN: 0366-6999.
CY China
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200112
ED Entered STN: 20011017
Last Updated on STN: 20020122
Entered Medline: 20011207
AB OBJECTIVE: To construct and evaluate a recombinant multi-epitope, multistage malaria **vaccine** candidate expressed in Escherichia coli (E. coli). METHODS: A hybrid gene (HGF) encoding several putative immunodominant T or T/B epitopes from **MSP**-1, **MSP**-2, Pf155/RESA of **Plasmodium falciparum** (P. falciparum) and two immune-stimulating epitopes from interleukin-1 and tetanus toxin was synthesized. Two copies of HGF and a copy of gene encoding Pattaroyo's Spf66 were connected together to construct a sandwich hybrid gene HGFSP. The gene was cloned into an expression vector pWR450-I for production of a fusion protein with beta-galactosidase. Efficacy of this **vaccine** candidate in inducing specific immunity against malaria parasites was evaluated. RESULTS: Immunization of different species of animals with purified recombinant peptide showed that the peptide was able to induce remarkable antibody response to the immunized peptide as well as falciparum malaria parasites. The epitopes included in the construct could induce antibodies against the intact parasite proteins as demonstrated by western blotting, indicating the epitopes retained their antigenicity in the new peptide construct. Antibodies from animals immunized with recombinant HGFSP peptide exhibited good ability in inhibition of the in vitro growth of malaria parasites, augmentation of phagocytosis of the parasites or infected RBC by phagocytes, and facilitation of antibody dependent cell mediated cytotoxicity to the cultured malaria parasites. CONCLUSION: The recombinant peptide seems to be a potential candidate which is valuable for further investigation.

L16 ANSWER 90 OF 195 MEDLINE on STN
AN 2000014343 MEDLINE
DN 20014343 PubMed ID: 10548307
TI Interethnic differences in the humoral response to non-repetitive regions of the **Plasmodium falciparum** circumsporozoite protein.
AU Modiano D; Chiucchiuini A; Petrarca V; Sirima B S; Luoni G; Roggero M A; Corradin G; Coluzzi M; Esposito F
CS Dipartimento di Biologia Molecolare, Cellulare e Animale, Universita di Camerino, Italy.
SO AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (1999 Oct) 61 (4) 663-7.
Journal code: 0370507. ISSN: 0002-9637.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199911
ED Entered STN: 20000111
Last Updated on STN: 20000111
Entered Medline: 19991116
AB We analyzed the humoral immune response to the amino- (amino acids 22-125) and carboxy-terminal (amino acids 289-390) non-repetitive domains of the

Plasmodium falciparum circumsporozoite protein (PfCSP) in individuals belonging to three west African ethnic groups (the Fulani, Mossi, and Rimaibe) living in the same conditions of hyperendemic transmission in a Sudan savanna area of Burkina Faso. Previous surveys conducted in the same area showed obvious interethnic differences in the susceptibility and immune reactivity to malaria, with the Fulani showing lower infection and disease rates and higher humoral responses to various P. falciparum antigens than sympatric ethnic groups. A total of 764 subjects (311 Mossi, 273 Rimaibe, and 180 Fulani) of all age classes were tested. The total mean +/- SE anti-(CSPf-N-term) and anti-(CSPf-C-term) seroprevalences were 65.6 +/- 1.7% and 57.0 +/- 1.8%, respectively. These seroprevalences were lower than that recorded in the same sample for the central (NANP)40 repetitive domain (88.3 +/- 1.2%). As previously reported for other P. falciparum antigens (PfCSP-(NANP)40, thrombospondin-related anonymous protein, **merozoite surface protein**-1, Pf155-ring-infected erythrocyte surface antigen, and Pf332), in spite of similar exposure to malaria, the Fulani showed higher immune reactivity than sympatric populations for both antigens tested. Our results confirm the presence of B cell epitopes in the non-repetitive regions of the PfCSP; moreover a further evidence of interethnic differences in the capacity to mount humoral responses against P. falciparum malaria was obtained. The assessment of the biological basis of interethnic heterogeneities in the susceptibility and in the humoral immune responses to malaria appears relevant in the development of anti-malaria **vaccines**.

L16 ANSWER 91 OF 195 MEDLINE on STN
AN 2000172080 MEDLINE
DN 20172080 PubMed ID: 10707101
TI Surprisingly little polymorphism in the **merozoite-surface-protein**-2 (**MSP**-2) gene of Indian **Plasmodium falciparum**.
AU Bhattacharya P R; Kumar M; Das R H
CS Malaria Research Centre, Delhi, India.
SO ANNALS OF TROPICAL MEDICINE AND PARASITOLOGY, (1999 Sep) 93 (6) 561-4. Journal code: 2985178R. ISSN: 0003-4983.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200003
ED Entered STN: 20000330
Last Updated on STN: 20000330
Entered Medline: 20000323
AB The polymorphism in the **merozoite-surface-protein**-2 (**MSP**-2) gene of six Indian **Plasmodium falciparum** isolates was studied by PCR amplification, cloning and sequencing. One of the isolates showed a deletion of 63 bp and all showed point mutations, although some of these mutations were silent. All the isolates also exhibited 5' and 3' conserved regions, with the two 32-mer amino-acid repeats characteristic of the FC27 family, and none belonged to the IC-1/3D7 family. Although the **MSP**-2 genes of these isolates represent new allelic sequences, they belong to the FC27 family and show remarkably little variation.

L16 ANSWER 92 OF 195 MEDLINE on STN
AN 1999451189 MEDLINE
DN 99451189 PubMed ID: 10519944
TI Phase I trial of two recombinant **vaccines** containing the 19kd carboxy terminal fragment of **Plasmodium falciparum merozoite surface protein** 1 (**msp**-1(19)) and T helper epitopes of tetanus toxoid.
AU Keitel W A; Kester K E; Atmar R L; White A C; Bond N H; Holland C A;

Krzych U; Palmer D R; Egan A; Diggs C; Ballou W R; Hall B F; Kaslow D
CS Department of Microbiology & Immunology, Baylor College of Medicine, One Baylor Plaza, Houston, TX 77030, USA.. wkeitel@bcm.tmc.edu
NC NO1-AI-25135 (NIAID)
SO VACCINE, (1999 Oct 14) 18 (5-6) 531-9.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT (CLINICAL TRIAL)
(CLINICAL TRIAL, PHASE I)
Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200001
ED Entered STN: 20000124
Last Updated on STN: 20000124
Entered Medline: 20000113
AB The safety and immunogenicity of 2 yeast-derived, blood-stage malaria **vaccines** were evaluated in a phase 1 trial. Healthy adults were given 2 or 3 doses of alum-adsorbed **vaccine** containing the 19 kDa carboxy-terminal fragment of the **merozoite surface protein**-1 (**MSP**-1(19)) derived from the 3D7 or the FVO strain of **Plasmodium falciparum** fused to tetanus toxoid T-helper epitopes P30 and P2. The first 2 doses of **MSP**-1(19) were well tolerated. Hypersensitivity reactions occurred in 3 subjects after the third dose of **MSP**-1(19), including bilateral injection site reactions in 2 (one with generalized skin rash), and probable histamine-associated hypotension in 1. Serum antibody responses to **MSP**-1(19) occurred in 5/16, 9/16 and 0/8 subjects given 20 microg of **MSP**-1(19), 200 microg of **MSP**-1(19), and control **vaccines** (hepatitis B or Td), respectively. Both **MSP**-1(19) **vaccines** were immunogenic in humans, but changes in formulation will be necessary to improve safety and immunogenicity profiles.

L16 ANSWER 93 OF 195 MEDLINE on STN
AN 2000196268 MEDLINE
DN 20196268 PubMed ID: 10447773
TI Immune responses to **Plasmodium falciparum merozoite surface protein** 1 (MSP1) antigen, II. Induction of parasite-specific immunoglobulin G in unsensitized human B cells after in vitro T-cell priming with MSP119.
AU Garraud O; Diouf A; Holm I; Perraut R; Longacre S
CS Unite d'Immunologie, Institut Pasteur, Dakar, Senegal.
SO IMMUNOLOGY, (1999 Jul) 97 (3) 497-505.
Journal code: 0374672. ISSN: 0019-2805.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200004
ED Entered STN: 20000421
Last Updated on STN: 20000421
Entered Medline: 20000410
AB A baculovirus recombinant antigen corresponding to the C-terminal 19 000 MW fragment of **Plasmodium falciparum merozoite surface protein** 1 (MSP119), has been used to prime T cells from individuals with no previous exposure to malaria, to provide help for the induction of a parasite specific antibody response in vitro. Although MSP119 alone could induce a small but detectable T-cell response, which included interleukin-4 (IL-4) secretion, this response was significantly increased by the presence of IL-2. In addition, IL-4 was shown to synergize with IL-2 for the induction of antigen-specific T-cell responses. If interferon-gamma (IFN-gamma), IL-12, or neutralizing

anti-IL-4 antibody was present at the time of priming, the T-cell responses were abolished. Parasite-specific immunoglobulin G (IgG) could be detected after secondary restimulation with MSP119, IL-10 and anti-CD40 monoclonal antibody in cultures containing MSP119 primed T cells, autologous B cells, IL-2 and IL-4. No antibody was secreted in the absence of primed T cells in this B-cell culture assay. These data show that recombinant MSP119, a leading malaria **vaccine** candidate, can prime non-immune human lymphocytes under defined in vitro experimental conditions, which include regulatory cytokines and/or other costimulatory molecules. This is a complementary approach for exploring immunogenic mechanisms of potential **vaccine** candidates such as P. falciparum antigens in humans.

L16 ANSWER 94 OF 195 MEDLINE on STN
AN 1999399004 MEDLINE
DN 99399004 PubMed ID: 10469053
TI Use of reconstituted influenza virus virosomes as an immunopotentiating delivery system for a peptide-based **vaccine**.
AU Poltl-Frank F; Zurbriggen R; Helg A; Stuart F; Robinson J; Gluck R; Pluschke G
CS Swiss Tropical Institute, Basel.
SO CLINICAL AND EXPERIMENTAL IMMUNOLOGY, (1999 Sep) 117 (3) 496-503. Journal code: 0057202. ISSN: 0009-9104.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199909
ED Entered STN: 19991005
Last Updated on STN: 19991005
Entered Medline: 19990923
AB Immunopotentiating reconstituted influenza virosomes (IRIV) were used as a delivery system for the synthetic peptide-based malaria **vaccine** SPf66. The reduced SPf66 peptide molecules containing terminal cysteine residues were covalently attached to phosphatidylethanolamine with the heterobifunctional crosslinker gamma-maleimidobutyric acid N-hydroxysuccinimide ester. The SPf66-phosphatidylethanolamine was incorporated into IRIV and BALB/c mice were immunized twice by intramuscular injection with peptide-loaded virosomes. Titres of elicited anti-SPf66 IgG were determined by ELISA. These titres were significantly higher and the required doses of antigen were lower, when mice had been preimmunized with a commercial whole virus influenza **vaccine**. After preimmunization with the influenza **vaccine**, SPf66-IRIV elicited far more consistently anti-SPf66 antibody responses than SPf(66)n adsorbed to alum. MoAb produced by four B cell hybridoma clones derived from a SPf66-IRIV-immunized mouse cross-reacted with **Plasmodium falciparum** blood stage parasites in immunofluorescence assays. All four MoAbs were specific for the **merozoite surface protein**-1 (**MSP**-1)-derived 83.1 portion of SPf66. Sequencing of their functionally rearranged kappa light chain variable region genes demonstrated that the four hybridomas were generated from clonally related splenic B cells. Biomolecular interaction analyses (BIA) together with these sequencing data provided evidence for the selection of somatically mutated affinity-matured B cells upon repeated immunization with SPf66-IRIV. The results indicate that IRIV are a suitable delivery system for synthetic peptide **vaccines** and thus have a great potential for the design of molecularly defined combined **vaccines** targeted against multiple antigens and development stages of one parasite, as well as against multiple pathogens.

L16 ANSWER 95 OF 195 MEDLINE on STN
AN 2000163005 MEDLINE
DN 20163005 PubMed ID: 10697897

TI Thrombospondin related adhesive protein (TRAP), a potential malaria **vaccine** candidate.
AU Dolo A; Modiano D; Doumbo O; Bosman A; Sidibe T; Keita M M; Naitza S; Robson K J; Crisanti A
CS Department d'Epidemiologie des Affections Parasitaires, Ecole Nationale de Medecine, de Pharmacie et d'Odonto-Stomatologie, Bamako, Mali.
SO PARASSITOLOGIA, (1999 Sep) 41 (1-3) 425-8. Ref: 32
Journal code: 0413724. ISSN: 0048-2951.
CY Italy
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 200004
ED Entered STN: 20000413
Last Updated on STN: 20000413
Entered Medline: 20000407
AB We have investigated whether naturally induced immunity to **Plasmodium falciparum** thrombospondin related adhesive protein contributes to protection against malaria in humans. We have carried out a case control study in children living in an endemic region of West Africa to reveal associations between PfTRAP seroprevalence and the risk of cerebral malaria. Sera collected from the case and control groups were analysed by ELISA to compare their serum reactivity against PfTRAP, the circumsporozoite protein and the **merozoite surface protein** 1. Children with uncomplicated malaria had a significantly higher PfTRAP seroprevalence when compared to children with cerebral malaria. The risk of developing cerebral malaria appeared to depend on the reciprocal relationship between sporozoite inoculation rates and humoral immunity against PfTRAP. Our results suggest that naturally induced humoral immunity against PfTRAP contributes to the development of protection against severe malaria. Experimentally induced immunity against TRAP in different rodent models has consistently proven to elicit a high degree of protection against malaria. This together with the functional properties of TRAP and data describing CD4 and CD8 epitopes for PfTRAP indicate that this molecule could increase the protective efficiency of available sporozoite malaria **vaccines**.

L16 ANSWER 96 OF 195 MEDLINE on STN
AN 2000163002 MEDLINE
DN 20163002 PubMed ID: 10697894
TI **Merozoite surface protein** 1, immune evasion, and **vaccines** against asexual blood stage malaria.
AU Holder A A; Guevara Patino J A; Uthaipibull C; Syed S E; Ling I T; Scott-Finnigan T; Blackman M J
CS Division of Parasitology, National Institute for Medical Research, London, UK.. aholder@pophost.nimr.mrc.ac.uk
SO PARASSITOLOGIA, (1999 Sep) 41 (1-3) 409-14. Ref: 33
Journal code: 0413724. ISSN: 0048-2951.
CY Italy
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 200004
ED Entered STN: 20000413
Last Updated on STN: 20000413
Entered Medline: 20000407
AB There is an urgent need for a **vaccine** against malaria and proteins on the surface of the merozoite are good targets for development as **vaccine** candidates because they are exposed to antibody.

However, it is possible that the parasite has evolved mechanisms to evade a protective immune response to these proteins. **Merozoite surface protein** 1 (**MSP**-1) is a candidate for **vaccine** development and its C-terminal sequence is the target of protective antibody. **MSP**-1 is cleaved by proteases in two processing steps, the second step releases the bulk of the protein from the surface and goes to completion during successful red blood cell invasion. Antibodies binding to the C-terminus of **Plasmodium falciparum MSP**-1 can inhibit both the processing and erythrocyte invasion. Other antibodies that bind to either the C-terminal sequence or elsewhere in the molecule are 'blocking' antibodies, which on binding prevent the binding of the inhibitory antibodies. Blocking antibodies are a mechanism of immune evasion, which may be based on antigenic conservation rather than diversity. This mechanism has a number of implications for the study of protective immunity and the development of malaria **vaccines**, emphasising the need for appropriate functional assays and careful design of the antigen.

L16 ANSWER 97 OF 195 MEDLINE on STN
AN 1999348464 MEDLINE
DN 99348464 PubMed ID: 10417674
TI Antibodies to a **merozoite surface protein** promote multiple invasion of red blood cells by malaria parasites.
AU Ramasamy R; Yasawardena S; Kanagaratnam R; Buratti E; Baralle F E; Ramasamy M S
CS Molecular Biology and Immunology Laboratories, Division of Life Sciences, Institute Fundamental Studies, Kandy, Sri Lanka.
SO PARASITE IMMUNOLOGY, (1999 Aug) 21 (8) 397-407.
Journal code: 7910948. ISSN: 0141-9838.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199909
ED Entered STN: 19991005
Last Updated on STN: 19991005
Entered Medline: 19990917
AB The 40-50 kDa merozoite surface antigen (MSA2) is a candidate molecule for use in a malaria **vaccine**. The gene for MSA2 from the 3D7 isolate of **Plasmodium falciparum** was amplified by polymerase chain reaction and cloned into the bacterial expression vector pGEX-3X to obtain a fusion protein of MSA2 with Schistosoma japonicum glutathione S-transferase. The recombinant fusion protein was used to immunize rabbits. After four injections, the sera had Western blotting and immunofluorescence titres of 10(-6). Immune sera, and immunoglobulin (Ig)G, F(ab)'2, F(ab) prepared from the immune sera, were assessed for their effects on the growth of 3D7 parasites in vitro by microscopy and a [3H]-hypoxanthine incorporation assay. The antibodies did not significantly inhibit red blood cell invasion and parasite growth when added to cultures as 10% v/v serum or as immunoglobulin preparations at concentrations up to 200 microg ml(-1). However, in the presence of IgG or F(ab)'2, but not F(ab), antibodies to MSA2, the proportions of red blood cells invaded by more than one merozoite increased significantly. Multiple invasion is attributed to merozoites cross-linked by bivalent antibodies, attaching to and subsequently invading the same red cell. These observations have a bearing on the evasion of host immune responses by the parasite and the use of full-length recombinant MSA2 protein in a malaria **vaccine**.

L16 ANSWER 98 OF 195 MEDLINE on STN
AN 1999282716 MEDLINE
DN 99282716 PubMed ID: 10354353
TI Antibodies against **Plasmodium falciparum**

vaccine candidates in infants in an area of intense and perennial transmission: relationships with clinical malaria and with entomological inoculation rates.

AU Kitua A Y; Urassa H; Wechsler M; Smith T; Vounatsou P; Weiss N A; Alonso P L; Tanner M

CS Ifakara Centre, PO Box 53, Ifakara, Tanzania.

SO PARASITE IMMUNOLOGY, (1999 Jun) 21 (6) 307-17.
Journal code: 7910948. ISSN: 0141-9838.

CY ENGLAND: United Kingdom

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

EM 199908

ED Entered STN: 19990910
Last Updated on STN: 19990910
Entered Medline: 19990820

AB Serum immunoglobulin (Ig)G1, IgG3 and total IgG were assessed by immunoabsorbent assay in 198 infants from a Tanzanian village highly endemic for **Plasmodium falciparum**. Antibodies were measured against epitopes of the circumsporozoite protein (the repetitive epitope (NANP)50 and a construct of the flanking regions (CS27IC)), the malaria **vaccine** SPf66, and two constructs of the **merozoite surface protein**-1 (**MSP**-1), a 19-kDa fragment from the C-terminal domain (**MSP**-119) and an N-terminal fragment spanning blocks 1-6 (H6-p190 M-1/6-H6). IgG1 and total IgG titres showed similar age profiles, all decreasing for the first 2 months of life. Anti-(NANP)50 titres remained very low throughout the first year of life, while anti-CS27IC antibody appeared to peak around 7 months of age. Only a slight tendency to increase with age was observed for levels of the other antibodies studied. IgG3 titres except for H6-p190(1/6), were very low initially and remained very low throughout the first year of life. Clinical malaria incidence at the village dispensary was analysed prospectively in relation to antibody. No IgG1 or total IgG titre showed protective effects, but low IgG3 against p190(1/6) appeared to be a risk factor in some age groups. Given the large number of antibodies tested, this single indication of possible protection could merely be chance. There were no strong associations between antibody titres and entomologically assessed sporozoite exposure suggesting that transmission-reducing interventions may have little effect on antibody levels in such children.

L16 ANSWER 99 OF 195 MEDLINE on STN

AN 2003054806 IN-PROCESS

DN 22451995 PubMed ID: 12563865

TI Humoral immune response in mice to hybrid nucleic acid **vaccines** containing **Plasmodium falciparum merozoite surface protein** 1 block 17-based gene.

AU Miao J; Li X; Xue C; Zhen R; Liu Z; Qin E; Yu Q

CS Department of Parasitology, Fourth Military Medical University, Xi'an 710032.

SO CHUNG-KUO CHI SHENG CHUNG HSUEH YU CHI SHENG CHUNG PING TSA CHIH. CHINESE JOURNAL OF PARASITOLOGY AND PARASITIC DISEASES, (1999) 17 (5) 302-4.
Journal code: 8709992. ISSN: 1000-7423.

CY China

DT Journal; Article; (JOURNAL ARTICLE)

LA Chinese

FS IN-PROCESS; NONINDEXED; Priority Journals

ED Entered STN: 20030205
Last Updated on STN: 20030205

AB AIM: To analyse the humoral immune response in mice to nucleic acid **vaccines** (VR1012/HG-MSP1-17 for intracellular expression or VR1012/TPA/HG-**MSP**-17 for secretion) containing **Plasmodium falciparum merozoite**

surface protein 1 (MSP1) 17 block gene and gene fragment of several T cell epitopes from MSA1, MSA2, RESA, IL-1 and TT. METHODS: BALB/c or C57BL/6 mice received three times intramuscular immunization with 200 micrograms/100 microliters or 100 micrograms/100 microliters of VR1012/HG-MSP1-17 or VR1012/TPA/HG-MSP1-17 per mouse each time. Anti-HG or anti-MSP1-17 antibodies were monitored by indirect ELISA. RESULTS: BALB/c and C57BL/6 mice immunized with 100 micrograms/100 microliters of VR1012/HG-MSP1-17 per mouse raised significantly anti-HG and anti-MSP1-17 antibodies, but the levels of antibodies were not high. BALB/c mice immunized with 200 micrograms/100 microliters of VR1012/HG-MSP1-17 per mouse raised higher anti-HG antibodies but not anti-MSP1-17 antibodies. BALB/c mice immunized with 200 micrograms/100 microliters of VR1012/TPA/HG-MSP1-17 per mouse raised low level of anti-HG antibodies only. CONCLUSION: VR1012/HG-MSP1-17 is more immunogenic than VR1012/TPA/HG-MSP1-17.

L16 ANSWER 100 OF 195 MEDLINE on STN
AN 2000017528 MEDLINE
DN 20017528 PubMed ID: 10551366
TI Lack of sequence diversity in the gene encoding **merozoite surface protein** 5 of **Plasmodium falciparum**.
AU Wu T; Black C G; Wang L; Hibbs A R; Coppel R L
CS Department of Microbiology, Monash University, Clayton, Vic., Australia.
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (1999 Oct 15) 103 (2) 243-50.
Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF106474; GENBANK-AF106475; GENBANK-AF106476; GENBANK-AF106477; GENBANK-AF106478; GENBANK-AF106479; GENBANK-AF106480; GENBANK-AF106481; GENBANK-AF106482; GENBANK-AF106483; GENBANK-AF106484; GENBANK-AF109394
EM 199912
ED Entered STN: 20000113
Last Updated on STN: 20000113
Entered Medline: 19991223
AB The gene encoding **merozoite surface protein** 5 (MSP5) of **Plasmodium falciparum** is situated between the genes encoding MSP2 and MSP4 on chromosome 2. Both MSP4 and MSP5 encode proteins that contain hydrophobic signal and glycosylphosphatidylinositol (GPI) attachment signals and a single epidermal growth factor (EGF)-like domain at their carboxyl termini. The similar gene organization, location and similar structural features of the two genes suggest that they have arisen from a gene duplication event. In this study we provide further evidence for the merozoite surface location of MSP5 by demonstrating that MSP5 is present in isolated merozoites, partitions in the detergent-enriched phase following Triton X-114 fractionation and shows a staining pattern consistent with merozoite surface location by indirect immunofluorescence confocal microscopy. Analysis of antigenic diversity of MSP5 shows a lack of sequence variation between various isolates of P. falciparum from different geographical locations, a feature unusual for surface proteins of merozoites and one that may simplify **vaccine** formulation.

L16 ANSWER 101 OF 195 MEDLINE on STN
AN 2000196228 MEDLINE
DN 20196228 PubMed ID: 10447733
TI Secretion of parasite-specific immunoglobulin G by purified blood B lymphocytes from immune individuals after in vitro stimulation with recombinant **Plasmodium falciparum merozoite surface protein**-119 antigen.
AU Garraud O; Diouf A; Holm I; Nguer C M; Spiegel A; Perraut R; Longacre S

CS Unite d'Immunologie, Institut Pasteur de Dakar, Senegal.
SO IMMUNOLOGY, (1999 Jun) 97 (2) 204-10.
Journal code: 0374672. ISSN: 0019-2805.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200004
ED Entered STN: 20000413
Last Updated on STN: 20000413
Entered Medline: 20000404
AB The C-terminal 19 000 MW fragment of **merozoite surface protein**-1 (MSP119) is one of the most promising candidate antigens for a malaria **vaccine**. Baculovirus recombinant **Plasmodium falciparum** MSP119 has been used to define conditions for the in vitro production of specific antibodies by purified human blood B cells in a culture system where T-cell signals were provided by the engagement of CD40 molecules and exogenous cytokines. MSP119 preferentially induced surface immunoglobulin G (IgG) -positive (sgamma+) B lymphocytes from P. falciparum-immune donors to differentiate and produce antigen-specific IgG. In contrast, naive B cells or cells from non-immune donors could not be induced to secrete parasite-specific IgG in vitro. Although IgG secretion was obtained in the absence of exogenous cytokines, it was dependent on B-cell-derived interleukin-10 (IL-10) and/or B-cell factor(s) under the control of IL-10, since IgG levels were significantly decreased in the presence of neutralizing anti-IL-10 antibodies. These results demonstrate at the cellular level that a single malaria **vaccine** candidate polypeptide can direct parasite-specific antibody production mediated by the secretion of potentiating factors.

L16 ANSWER 102 OF 195 MEDLINE on STN
AN 2000058744 MEDLINE
DN 20058744 PubMed ID: 10593171
TI Antigenic and sequence diversity at the C-terminus of the **merozoite surface protein**-1 from rodent malaria isolates, and the binding of protective monoclonal antibodies.
AU Benjamin P A; Ling I T; Clottey G; Valero L M; Ogun S A; Fleck S L; Walliker D; Morgan W D; Birdsall B; Feeney J; Holder A A
CS Division of Parasitology, National Institute for Medical Research, London, UK.
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (1999 Nov 30) 104 (2) 147-56.
Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF165927; GENBANK-AF165928; GENBANK-AF165929; GENBANK-AF165930; GENBANK-AF165931; GENBANK-AF165932; GENBANK-AF165934; GENBANK-AF165935; GENBANK-AF165936; GENBANK-AF165937; GENBANK-AF165938
EM 200002
ED Entered STN: 20000229
Last Updated on STN: 20000229
Entered Medline: 20000214
AB **Merozoite surface protein**-1 (**MSP**-1) is a major candidate in the development of a **vaccine** against malaria. Immunisation with a recombinant fusion protein containing the two Plasmodium yoelii **MSP**-1 C-terminal epidermal growth factor-like domains (**MSP**-1(19)) can protect mice against homologous but not heterologous challenge, and therefore, antigenic differences resulting from sequence diversity in **MSP**-1(19) may be crucial in determining the potential of this protein as a **vaccine**. Representative sequence variants from a number of

distinct P. yoelii isolates were expressed in Escherichia coli and the resulting recombinant proteins were screened for binding to a panel of monoclonal antibodies (Mabs) capable of suppressing a P. yoelii YM challenge infection in passive immunisation experiments. The sequence polymorphisms affected the binding of the antibodies to the recombinant proteins. None of the Mabs recognised **MSP**-1(19) of P. yoelii yoelii 2CL or 33X or P. yoelii nigeriensis N67. The epitopes recognised by the Mabs were further distinguished by their reactivity with the other fusion proteins. The extent of sequence variation in **MSP**-1(19) among the isolates was extensive, with differences detected at 35 out of the 96 positions compared. Using the 3-dimensional structure of the **Plasmodium falciparum MSP**-1(19) as a model, the locations of the amino acid substitutions that may affect Mab binding were identified. The DNA sequence of **MSP**-1(19) from two Plasmodium vinckei isolates was also cloned and the deduced amino acid sequence compared with that in other species.

L16 ANSWER 103 OF 195 MEDLINE on STN
AN 1999222525 MEDLINE
DN 99222525 PubMed ID: 10205793
TI Human antibodies to the 19kDa C-terminal fragment of **Plasmodium falciparum merozoite surface protein** 1 inhibit parasite growth in vitro.
AU Egan A F; Burghaus P; Druilhe P; Holder A A; Riley E M
CS Institute of Cell, Animal and Population Biology, University of Edinburgh, Scotland, UK.
SO PARASITE IMMUNOLOGY, (1999 Mar) 21 (3) 133-9.
Journal code: 7910948. ISSN: 0141-9838.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199906
ED Entered STN: 19990714
Last Updated on STN: 19990714
Entered Medline: 19990629
AB The 19kDa, C-terminal fragment of the major surface protein of **Plasmodium falciparum** (PfMSP1(19)) is a candidate for inclusion in a subunit malaria **vaccine**. In this study, we show that PfMSP1(19)-specific antibodies, affinity purified from malaria-immune human serum, can: (i) compete with invasion-inhibitory monoclonal antibodies for binding to PfMSP1(19) and (ii) mediate inhibition of parasite growth in vitro, in the absence of complement and mononuclear cells, at physiological antibody concentrations (100 micrograms/ml). Parasites expressing either the K1 or 3D7 allele of PfMSP1(19) were equally susceptible to inhibition of merozoite invasion, indicating that the target epitopes of inhibitory antibodies are conserved or cross-reactive. These studies suggest that **vaccines** designed to induce antibodies to PfMSP1(19) may protect against the high levels of malaria parasitaemia which are associated with clinical disease.

L16 ANSWER 104 OF 195 MEDLINE on STN
AN 1999143796 MEDLINE
DN 99143796 PubMed ID: 9989251
TI Model multiple antigenic and homopolymeric peptides from non-repetitive sequences of malaria merozoite proteins elicit biologically irrelevant antibodies.
AU Ramasamy R; Kanagaratnam R; Chandanie P D; Kulachelvy K; Ramasamy M S; Dharmasena P M
CS Molecular Biology Laboratory, Institute of Fundamental Studies, Kandy, Sri Lanka.. ramasamy@slt.lk
SO BIOCHIMICA ET BIOPHYSICA ACTA, (1999 Jan 6) 1453 (1) 115-25.
Journal code: 0217513. ISSN: 0006-3002.

CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199902
ED Entered STN: 19990311
Last Updated on STN: 19990311
Entered Medline: 19990225
AB Three model peptides containing B-epitopes from conserved, non-repetitive regions of the merozoite surface antigens, MSA2 and MSA1, and the erythrocyte binding protein EBP of **Plasmodium falciparum** were synthesised. The peptides incorporated GPG spacers and C residues at the N and C termini, and were polymerised by oxidation to form cystine bridges. Multiple copies of essentially the same peptide sequences were also synthesised on a branching lysyl matrix to form a tetrameric multiple antigen peptide. Rabbits were immunised with the polymerised and multiple antigen peptides, in alum followed by Freund's adjuvant, and the antibody responses examined by IFA and ELISA. Reproducible antibody responses were obtained against the MSA1 and EBP but not MSA2 peptides. IgG antibody levels detected by ELISA after three injections of antigen in alum, increased significantly after further immunisation in Freund's adjuvant. IgG levels were largely maintained for at least 23 weeks after the final immunisation. IgM antibodies, generally detectable only after immunisation in Freund's adjuvant, were absent 23 weeks later. Antibody titres against the native protein on fixed parasites, assayed by IFA, were three to five orders of magnitude lower than the corresponding ELISA titres against the peptides. Antibody-dependent inhibition of P. falciparum growth in vitro could not be demonstrated with the immune rabbit sera. The MSA1 and EBP peptides elicited cross-reactive antibodies. The results suggest that the selected non-repetitive sequences are conformationally constrained in the native proteins and only a small proportion of the anti-peptide antibodies bind to the native proteins. The significance of the findings for the development of peptide **vaccines** and the use of peptides in immunoassays is discussed.

L16 ANSWER 105 OF 195 MEDLINE on STN
AN 1999359012 MEDLINE
DN 99359012 PubMed ID: 10432065
TI Genetic polymorphism of falciparum malaria **vaccine** candidate antigen genes among field isolates in India.
AU Ranjit M R; Sharma Y D
CS Department of Biotechnology, All India Institute of Medical Sciences, New Delhi.
SO AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (1999 Jul) 61 (1) 103-8.
Journal code: 0370507. ISSN: 0002-9637.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199908
ED Entered STN: 19990827
Last Updated on STN: 19990827
Entered Medline: 19990817
AB The present study was designed to investigate the genetic diversity of **Plasmodium falciparum** among field isolates from India.
A total of 71 clinical isolates were analyzed by the polymerase chain reaction (PCR) for the amplification of repeat regions of malaria **vaccine** candidate antigen genes, i.e., merozoite surface antigen-1 (MSA-1), MSA-2, and circumsporozoite protein (CSP). All three genes showed variation; MSA-2 has the maximum number of 10 variant forms while MSA-1 and CSP had 8 and 6 variants, respectively. Some variant forms were more common than others among the clinical isolates. There were mixed

alleles for each gene in several (27 of 71) cases. The MSA-2 gene showed the maximum number of cases with mixed alleles (22 of 65 [33.85%]) compared with MSA-1 (10 of 68 [14.7%]) and CSP (10 of 65 [15.38%]). Fifty-five (88.7%) of 62 clinical isolates of P. falciparum showed a different genotype. The malaria hyperendemic region (Orissa) not only showed the maximum number of variant forms of each gene but also the maximum number of cases with mixed alleles compared with the non-hyperendemic regions (Madhya Pradesh and Rajasthan). The presence of such large numbers of P. falciparum strains in India should be taken into account in future malaria **vaccine** programs.

L16 ANSWER 106 OF 195 MEDLINE on STN
AN 1999378923 MEDLINE
DN 99378923 PubMed ID: 10450429
TI Reduction in the mean number of **Plasmodium falciparum** genotypes in Gambian children immunized with the malaria **vaccine** SPf66.
AU Haywood M; Conway D J; Weiss H; Metzger W; D'Alessandro U; Snounou G; Targett G; Greenwood B
CS Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, UK.
SO TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, (1999 Feb) 93 Suppl 1 65-8.
Journal code: 7506129. ISSN: 0035-9203.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199908
ED Entered STN: 19990913
Last Updated on STN: 19990913
Entered Medline: 19990831
AB SPf66, a synthetic peptide **Plasmodium falciparum** **vaccine**, did not protect young Gambian children against clinical attacks of malaria. Nevertheless, Gambian children who had been vaccinated with SPf66 and who were parasitaemic at the end of the first malaria transmission season after vaccination had significantly fewer detectable P. falciparum genotypes than control children, as determined by polymerase chain reaction analysis of 3 polymorphic loci--the msp1 block 2 repeat region, the msp2 repeat region, and the R11 region of the glutamate-rich protein gene (glurp). Geometric mean numbers of genotypes were 1.66 vs. 1.87, 1.95 vs. 2.43, and 1.21 vs. 1.50 for msp1, msp2 and glurp, respectively ($P = 0.31$, $P = 0.04$ and $P < 0.01$). Differences between groups became a little more marked for msp1 and msp2 when children with symptomatic malaria were excluded. No significant difference was found between parasites obtained from SPf66-vaccinated or control children in the prevalences of amino acid alleles at positions 44 and 47 in the 11 amino acid sequence of the **merozoite surface protein** 1 molecule, which is present in SPf66. The reduction in the number of genotypes observed could not be explained by a difference in parasite densities between SPf66-vaccinated and control children, as geometric mean parasite densities were almost identical in the 2 groups. These observations suggest that SPf66 **vaccine** may have induced an immune response which reduced the incidence of new infections in immunized children or accelerated the rate of clearance of parasites of individual genotypes. However, no reduction in the prevalence or density of parasitaemia was recorded in SPf66-vaccinated children, suggesting the existence of some kind of density-dependent mechanism for controlling low levels of malaria parasitaemia.

L16 ANSWER 107 OF 195 MEDLINE on STN
AN 1999214067 MEDLINE
DN 99214067 PubMed ID: 10196473

TI Allelic recombination and linkage disequilibrium within **Msp**-1 of **Plasmodium falciparum**, the malignant human malaria parasite.
AU Sakihama N; Kimura M; Hirayama K; Kanda T; Na-Bangchang K; Jongwutiwes S; Conway D; Tanabe K
CS Laboratory of Biology, Osaka Institute of Technology, Ohmiya, Asahi-ku, Osaka 535-8585, Japan.
SO GENE, (1999 Apr 1) 230 (1) 47-54.
Journal code: 7706761. ISSN: 0378-1119.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AB016616; GENBANK-AB016617; GENBANK-AB016618
EM 199905
ED Entered STN: 19990607
Last Updated on STN: 19990607
Entered Medline: 19990524
AB The C-terminal, cysteine-rich 19kDa domain of **merozoite surface protein**-1 (**MSP**-1) of **Plasmodium falciparum** is a target of the host's humoral immunity and thus a malaria **vaccine** candidate. Although variation in the 19kDa domain is limited among parasite isolates, tertiary structure-dependent intramolecular associations between the 19kDa domain and other parts of **MSP**-1 are suggested to be involved in immune evasion by allowing competitive binding of protective and non-protective antibodies directed to their epitopes, which are conformationally in close proximity but separated at the primary structure. Since allelic recombination can account for the major variability of the **Msp**-1 gene, we examined whether linkage disequilibrium occurs between polymorphic loci in the 5'- and the 3'-region, the latter encoding the 19kDa domain. From 184 Thai field isolates, we selected 69 isolates with a single allelic type in six variable blocks of **Msp**-1 as determined by PCR-based allelic typing. All the isolates showed no evidence of recombination in blocks 6 to 16, whereas recombination was apparent in blocks 2 to 6. Sequencing of the 3'-region revealed two potential recombination sites in block 17. Strong linkage disequilibrium was seen between polymorphic loci in the 5'- and 3'-regions. The strength of this disequilibrium did not correlate with distance between loci. We discuss the possible role of epistatic selection on particular association types (haplotypes) of **Msp**-1.

L16 ANSWER 108 OF 195 MEDLINE on STN
AN 1999254761 MEDLINE
DN 99254761 PubMed ID: 10323182
TI Heritability and segregation analysis of immune responses to specific malaria antigens in Papua New Guinea.
AU Stirnadel H A; Beck H P; Alpers M P; Smith T A
CS Department of Public Health and Epidemiology, Swiss Tropical Institute, Basel.. stirnadel@ubaclu.unibas.ch
SO GENETIC EPIDEMIOLOGY, (1999) 17 (1) 16-34.
Journal code: 8411723. ISSN: 0741-0395.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199906
ED Entered STN: 19990628
Last Updated on STN: 19990628
Entered Medline: 19990615
AB Familial patterns of inheritance of immune responses to specific **Plasmodium falciparum** antigens were studied in 214 adults in an area of Papua New Guinea highly endemic for malaria.

Preliminary variance component analysis indicated familial aggregation in both humoral and cellular immune responses against the ring-infected erythrocyte surface antigen (RESA) and the FC27 allele of the Merozoite surface antigen 2 (MSA-2). Including a term for sharing houses in the models affected only the antibody response to RESA. Segregation analysis of the antibody responses against RESA indicated inheritance via a multifactorial model and analysis of the proliferation response suggested a possible recessive major gene. The best fitting models for the immune responses against MSA-2 (FC27) postulated dominant major gene inheritance. We found no significant associations between HLA class I or II alleles and these two antigens in this population. Although there was evidence of familial aggregation of antibody responses to MSA-2 (3D7), the segregation analysis failed to identify a mode of inheritance. There was little or no heritability of either humoral or cellular immune responses against the NANP repeats of the Circumsporozoite protein (NANP), the synthetic malaria **vaccine** SPf66, or a preparation of MSA-2 (3D7) from which the repetitive part was deleted (MSA-2 (d3D7)). Although it is often difficult to separate genetic effects from the effects of living in the same environment, it appears that some immune responses against certain malaria antigens may be partly influenced by genetic factors.

L16 ANSWER 109 OF 195 MEDLINE on STN
AN 1999122345 MEDLINE
DN 99122345 PubMed ID: 9924957
TI Antibody response to the N and C-terminal regions of the Plasmodium vivax **Merozoite Surface Protein** 1 in individuals living in an area of exclusive transmission of P. vivax malaria in the north of Brazil.
AU Soares I S; Oliveira S G; Souza J M; Rodrigues M M
CS Departamento de Patologia, Centro de Ciencias Biologicas, Universidade Federal do Para, Belem, Pa, Brazil.
SO ACTA TROPICA, (1999 Jan 15) 72 (1) 13-24.
Journal code: 0370374. ISSN: 0001-706X.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199904
ED Entered STN: 19990504
Last Updated on STN: 19990504
Entered Medline: 19990419
AB Recently, we found that a recombinant protein based on the 19 kDa C-terminal region of the Plasmodium vivax **Merozoite Surface Protein** 1 (PvMSP1(19)) was recognized by a large proportion of individuals naturally infected. The present study was designed to determine the prevalence of antibody to PvMSP1(19) in individuals from the village of Cotijuba, northern Brazil, where only P. vivax transmission occurs. Immuno-epidemiological studies on the prevalence of antibody to the C-terminus of PvMSP1 are of particular importance as this region of MSP1 is being intensively studied as a prime candidate for development of a **vaccine** against malaria. We evaluated the antibody response to PvMSP1(19), and compared it to the N-terminal region of PvMSP1 and to blood stage antigens. The total frequencies of individuals with IgG to blood stages, PvMSP1(19) or the N-terminal region of PvMSP1 were 76.6, 42.3 and 29.8%, respectively. The frequency of responders to PvMSP1(19) did not increase with age. However, the frequency of responders to this recombinant protein was significantly higher (77.4%) in individuals with a recent (< 6 months) history of malaria, when compared to subjects whose last malaria attack occurred more than 6 months before (43.9%), or to individuals without a past history of symptomatic malaria (6.25%). These results confirm earlier studies by demonstrating that the PvMSP1(19) is highly immunogenic in individuals recently exposed to P. vivax malaria.

L16 ANSWER 110 OF 195 MEDLINE on STN
AN 1999263453 MEDLINE
DN 99263453 PubMed ID: 10329360
TI **Plasmodium falciparum**: variations in the C-terminal cysteine-rich region of the **merozoite surface protein**-1 in field samples among Indian isolates.
AU Lalitha P V; Malhotra P; Chattopadhyay R; Chauhan V S
CS International Centre for Genetic Engineering and Biotechnology, Aruna Asaf Ali Marg, New Delhi, 110067, India.
SO EXPERIMENTAL PARASITOLOGY, (1999 May) 92 (1) 12-8.
Journal code: 0370713. ISSN: 0014-4894.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-Y10598; GENBANK-Y10599; GENBANK-Y10600
EM 199905
ED Entered STN: 19990614
Last Updated on STN: 19990614
Entered Medline: 19990528
AB The cysteine-rich C-terminal region of the **merozoite surface protein**-1, **MSP**-119, of **Plasmodium falciparum** has been the most promising **vaccine** target antigen to date, based on protective immunization studies with recombinant proteins in mice and monkey models. To be further developed as a **vaccine** candidate, it is essential to study its sequence heterogeneity in field isolates from diverse geographical areas. We have analyzed the DNA sequences encoding the C-terminal region of P. falciparum **MSP**-1 (1526-1744 aa, corresponding to part of the 16th and all of the 17th blocks) of 16 isolates from different regions in India. The PNG-MAD20 type of **MSP**-1 sequence predominated in this subcontinent. The **MSP**-119 region as usual was found to be highly conserved, with amino acid variations at four positions. Based on these variations, only three **MSP**-119 forms (Q-KNG, E-KNG, and E-TSG, a novel variant) were detected among these isolates. The two **MSP**-119 variant forms (Q-KNG and E-TSG) were expressed in Escherichia coli as histidine-tagged polypeptides and were characterized immunologically to corroborate the sequence data.

L16 ANSWER 111 OF 195 MEDLINE on STN
AN 2003054749 MEDLINE
DN 22451938 PubMed ID: 12563808
TI Recombination and cloning of MSP1(19) and PfCMR of **Plasmodium falciparum**.
AU Li X; Yu X; Luo S
CS Department of Parasitology, Sun Yat-sen University of Medical Sciences, Guangzhou 510089.
SO CHUNG-KUO CHI SHENG CHUNG HSUEH YU CHI SHENG CHUNG PING TSA CHIH CHINESE JOURNAL OF PARASITOLOGY AND PARASITIC DISEASES, (1999) 17 (1) 12-5.
Journal code: 8709992. ISSN: 1000-7423.
CY China
DT Journal; Article; (JOURNAL ARTICLE)
LA Chinese
FS Priority Journals
EM 200305
ED Entered STN: 20030205
Last Updated on STN: 20030517
Entered Medline: 20030516
AB AIM: To construct a recombinant plasmid DNA encoding multiantigens of **Plasmodium falciparum** and to provide the requirements

for DNA immunization. METHODS: Two oligonucleotide primers were designed to amplify MSP1(19), the purified PCR products were digested by Sal I + Xba I, and the recombinant plasmid pWR450-1/PfCMR was digested by EcoR I + Sal I to recover PfCMR gene. PfCMR and MSP1(19) gene fragments were linked and recombined with mammalian expression vector pcDNA3. RESULTS: The MSP1(19) gene fragment with about 363 base pairs were specifically amplified by using PCR technique. The positive recombinant pcDNA3-PfCMR-MSP1(19) (named pcDNA3-Pf8) was screened and identified by agarose gel electrophoresis, endonulease digestion and PCR technique, the whole length of Pf8 is 618 bp. CONCLUSION: By specifically amplifying MSP1(19) gene at the C-terminal of MSP1, a recombinant plasmid pcDNA3-Pf8 encoding multiantigens of **Plasmodium falciparum** was successfully constructed.

L16 ANSWER 112 OF 195 MEDLINE on STN
AN 1999143785 MEDLINE
DN 99143785 PubMed ID: 9989240
TI Mammalian cell expression of malaria **merozoite surface proteins** and experimental DNA and RNA immunisation.
AU Ramasamy R; Yasawardena S G; Kanagaratnam R; Buratti E; Baralle F E; Ramasamy M S
CS Molecular Biology and Immunology Laboratories, Institute of Fundamental Studies, Kandy, Sri Lanka.. ramasamy@slt.lk
SO BIOCHIMICA ET BIOPHYSICA ACTA, (1999 Jan 6) 1453 (1) 1-13.
Journal code: 0217513. ISSN: 0006-3002.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199902
ED Entered STN: 19990311
Last Updated on STN: 20000303
Entered Medline: 19990225
AB The gene for a 45 kDa **merozoite surface protein** (MSA-2) of the human malaria parasite **Plasmodium falciparum** was PCR amplified and cloned into eukaryotic expression vectors VR1012 and pcDNA3 to yield plasmids P1 and P2, respectively. The coding sequences for two N-terminal fragments of the 185 kDa **merozoite surface protein** (MSA-1) gene were similarly PCR amplified and cloned into vectors VR1020 and VR1012 to yield plasmids P3 and P4, respectively. The MSA-1 signal peptide sequence, present in P4, was replaced with the human tissue plasminogen activator signal sequence in P3. The four plasmids expressed the cloned genes under the control of the cytomegalovirus promoter and carried 3' bovine growth hormone termination/poly A signals. P1, P3 and P4 also contained the cytomegalovirus intron A enhancer sequence. MSA-1 expression was more readily detected than MSA-2 in Cos cells transfected with P3/P4 and P1/P2 respectively. The MSA-2 gene was also cloned into the phagemid pBluescript IISK+ with and without a 3' poly A tail composed of 35 A residues. MSA-2 was synthesised in HeLa cells infected with a recombinant vaccinia virus carrying T7 RNA polymerase when MSA-2 recombinant pBluescript was transfected into the cells. Inoculation with P1 intramuscularly or intradermally and with P2 intradermally into rabbits led to the production of antibodies to MSA-2 detectable by immunofluorescence and Western blotting. Antibodies were also produced against MSA-1 after intramuscular/intradermal inoculation with P3 and P4. Inoculation of rabbits with MSA-2 mRNA yielded better antibody titres when a poly A tail was present. Antibody levels were maintained for > 9 weeks after the final immunisation. However the immune sera failed to inhibit in vitro parasite growth.

L16 ANSWER 113 OF 195 MEDLINE on STN
AN 1998244588 MEDLINE

DN 98244588 PubMed ID: 9585189
TI Slow progress in malaria **vaccine** development.
AU Dove A
SO NATURE MEDICINE, (1998 May) 4 (5 Suppl) 479.
Journal code: 9502015. ISSN: 1078-8956.
CY United States
DT News Announcement
LA English
FS Priority Journals
EM 199805
ED Entered STN: 19980529
Last Updated on STN: 19990129
Entered Medline: 19980521

L16 ANSWER 114 OF 195 MEDLINE on STN
AN 1999003146 MEDLINE
DN 99003146 PubMed ID: 9784540
TI Pathways for potentiation of immunogenicity during adjuvant-assisted immunizations with **Plasmodium falciparum** major **merozoite surface protein** 1.
AU Hui G S; Hashimoto C N
CS Department of Tropical Medicine, University of Hawaii, Honolulu, Hawaii 96816, USA.. ghui@hawaii.edu
NC AI31058U (NIAID)
SO INFECTION AND IMMUNITY, (1998 Nov) 66 (11) 5329-36.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199811
ED Entered STN: 19990106
Last Updated on STN: 19990106
Entered Medline: 19981123
AB **Vaccine** adjuvants exert critical and unique influences on the quality of immune responses induced during active immunizations. We investigated the mechanisms of action of immunological adjuvants in terms of their requirements for cytokine-mediated pathways for adjuvanticity. Antibody responses potentiated by several adjuvants to a **Plasmodium falciparum** MSP1-19 (C-terminal 19-kDa processing fragment of MSP1) **vaccine** were studied in gamma interferon (IFN-gamma) or interleukin (IL-4) knockout mice. The levels of anti-MSP1-19 antibodies and the induction of Th1- and Th2-type antibodies were analyzed. Results revealed a spectrum of requirements for cytokine-mediated pathways in the potentiation of immunogenicity, and such requirements were influenced by interactions among individual components of the adjuvant formulations. One adjuvant strictly depended on IFN-gamma to induce appreciable levels of anti-MSP1-19 antibodies, while some formulations required IFN-gamma only for the induction of Th1-type antibodies. Other formulations induced exclusively Th2-type antibodies and were not affected by IFN-gamma knockout. There were three patterns of requirements for IL-4 by various adjuvants in the induction of Th2-type anti-MSP1-19 antibodies. Moreover, the induction of Th1-type anti-MSP1-19 antibodies by adjuvants showed two distinct patterns of regulation by IL-4. The utilization of an IL-4 regulated pathway(s) for the induction of Th2-type antibodies by the same adjuvant differed between mouse strains, suggesting that animal species variability in responses to **vaccine** adjuvants may be due, at least in part, to differences in the utilization of immune system pathways by an adjuvant among animal hosts.

L16 ANSWER 115 OF 195 MEDLINE on STN
AN 1999117061 MEDLINE

DN 99117061 PubMed ID: 9920333
TI Allelic diversity in the **merozoite surface protein**-1 and epidemiology of multiple-clone **Plasmodium falciparum** infections in northern Tanzania.
AU Ferreira M U; Liu Q; Kimura M; Ndawi B T; Tanabe K; Kawamoto F
CS Department of International Health, Nagoya University School of Medicine, Japan.
SO JOURNAL OF PARASITOLOGY, (1998 Dec) 84 (6) 1286-9.
Journal code: 7803124. ISSN: 0022-3395.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199902
ED Entered STN: 19990216
Last Updated on STN: 19990216
Entered Medline: 19990203
AB Allelic diversity in the **merozoite surface protein**-1 (**MSP**-1) of **Plasmodium falciparum**, a major malaria **vaccine** candidate, was examined in clinical isolates from holoendemic northern Tanzania. The variable blocks 2, 4a, 4b, 6, and 10 of the **MSP**-1 gene were typed by allelic type-specific polymerase chain reaction. Twenty-four possible **MSP**-1 gene types were defined as unique combinations of allelic types detected in each variable block. Thirteen gene types were identified, and 187 P. falciparum populations were fully typed among 79 isolates. In contrast with recent findings in Vietnam, we were unable to detect nonrandom associations between allelic types in the typed variable blocks. Most patients (60%) harbored more than 1 genetically distinct parasite population (average: 2.37 populations per isolate) and, in 1 patient, 6 different versions of this single-copy gene were found. Statistical analysis suggests that parasites carrying different **MSP**-1 gene types are not independently distributed in the host population. The epidemiological consequences of these findings are discussed.

L16 ANSWER 116 OF 195 MEDLINE on STN
AN 1998225035 MEDLINE
DN 98225035 PubMed ID: 9565362
TI Multi-plasmid DNA vaccination avoids antigenic competition and enhances immunogenicity of a poorly immunogenic plasmid.
AU Grifantini R; Finco O; Bartolini E; Draghi M; Del Giudice G; Kocken C; Thomas A; Abrignani S; Grandi G
CS Chiron Vaccines, S.p.A., Siena, Italy.
SO EUROPEAN JOURNAL OF IMMUNOLOGY, (1998 Apr) 28 (4) 1225-32.
Journal code: 1273201. ISSN: 0014-2980.
CY GERMANY: Germany, Federal Republic of
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199805
ED Entered STN: 19980520
Last Updated on STN: 20020730
Entered Medline: 19980513
AB DNA immunization is a very promising approach to the formulation of multivalent **vaccines**. However, little information is currently available on the immunogenicity of multi-plasmid formulations. To address this issue, we immunized mice with a combination of four plasmids encoding malarial antigens and we compared antibody responses with those obtained with single-plasmid injections. We found that when four plasmids encoding **Plasmodium falciparum** circumsporozoite protein, thrombospondin-related anonymous protein, major **merozoite surface protein** (**MSP**)1 and Pfs25 are

co-injected into mice, Ab responses against each antigen are elicited at levels at least as high as the level obtained with single-plasmid injection. The quality of antibody production, as determined by isotype analysis, was similar when single- and multi-plasmid administrations were compared, indicating the priming of the same cytokine profile for CD4+ T helper cells. The sera from mice immunized with the four-plasmid formulation specifically recognized sporozoites, blood stage schizonts and gametes, indicating that DNA immunization induced antibody responses relevant to the native conformation. Finally and of particular interest, in the case of MSP1, the antibody response appears to be strongly potentiated by the presence of additional plasmids, indicating an adjuvant effect of DNA.

L16 ANSWER 117 OF 195 MEDLINE on STN
AN 1999048222 MEDLINE
DN 99048222 PubMed ID: 9830530
TI Allelic diversity at the **merozoite surface protein**-1 (**MSP**-1) locus in natural **Plasmodium falciparum** populations: a brief overview.
CM Erratum in: Mem Inst Oswaldo Cruz 1999 Jan-Feb;94(1):138
AU Ferreira M U; Kaneko O; Kimura M; Liu Q; Kawamoto F; Tanabe K
CS Departamento de Parasitologia, ICB, Universidade de Sao Paulo, Brasil.. muferrei@usp.br
SO MEMORIAS DO INSTITUTO OSWALDO CRUZ, (1998 Sep-Oct) 93 (5) 631-8. Journal code: 7502619. ISSN: 0074-0276.
CY Brazil
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199903
ED Entered STN: 19990326
Last Updated on STN: 20000303
Entered Medline: 19990317
AB The **merozoite surface protein**-1 (**MSP**-1) locus of **Plasmodium falciparum** codes for a major asexual blood-stage antigen currently proposed as a major malaria **vaccine** candidate. The protein, however, shows extensive polymorphism, which may compromise its use in sub-unit **vaccines**. Here we compare the patterns of allelic diversity at the **MSP**-1 locus in wild isolates from three epidemiologically distinct malaria-endemic areas: the hypoendemic southwestern Brazilian Amazon (n = 54), the mesoendemic southern Vietnam (n = 238) and the holoendemic northern Tanzania (n = 79). Fragments of the variable blocks 2, 4a, 4b and 6 or 10 of this single-copy gene were amplified by the polymerase chain reaction, and 24 **MSP**-1 gene types were defined as unique combinations of allelic types in each variable block. Ten different **MSP**-1 types were identified in Brazil, 23 in Vietnam and 13 in Tanzania. The proportion of genetically mixed infections (isolates with parasites carrying more than one **MSP**-1 version) ranged from 39% in Brazil to 44% in Vietnam and 60% in Tanzania. The vast majority (90%) of the typed parasite populations from Brazil and Tanzania belonged to the same seven most frequent **MSP**-1 gene types. In contrast, these seven gene types corresponded to only 61% of the typed parasite populations from Vietnam. Non-random associations were found between allelic types in blocks 4a and 6 among Vietnamese isolates, the same pattern being observed in independent studies performed in 1994, 1995 and 1996. These results suggest that **MSP**-1 is under selective pressure in the local parasite population. Nevertheless, the finding that similar **MSP**-1 type frequencies were found in 1994 and 1996 argues against the prominence of short-term frequency-dependent immune selection of **MSP**-1 polymorphisms. Non-random associations between **MSP**-1 allelic types, however, were not detected among isolates from Brazil and Tanzania. A preliminary analysis of the

distribution of **MSP**-1 gene types per host among isolates from Tanzania, but not among those from Brazil and Vietnam, shows significant deviation from that expected under the null hypothesis of independent distribution of parasites carrying different gene types in the human hosts. Some epidemiological consequences of these findings are discussed.

L16 ANSWER 118 OF 195 MEDLINE on STN
AN 1999005098 MEDLINE
DN 99005098 PubMed ID: 9790438
TI Immunization with SPf66 and subsequent infection with homologous and heterologous **Plasmodium falciparum** parasites.
AU Masinde G L; Krogstad D J; Gordon D M; Duffy P E
CS Kenya Medical Research Institute (KEMRI), Nairobi.
NC AI-25136 (NIAID)
SO AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (1998 Oct) 59 (4) 600-5.
Journal code: 0370507. ISSN: 0002-9637.
CY United States
DT (CLINICAL TRIAL)
Journal; Article; (JOURNAL ARTICLE)
(RANDOMIZED CONTROLLED TRIAL)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199811
ED Entered STN: 19990106
Last Updated on STN: 19990106
Entered Medline: 19981105
AB In an area of intense transmission, a malaria **vaccine** could reduce infection due to the parasite types represented in the **vaccine**, but have no detectable effect on the overall frequency of infection if it did not protect against infection with heterologous parasites. These studies were performed to determine whether immunization with SPf66 decreased infection with homologous parasites containing the 11 amino acid peptide from **merozoite surface protein**-1 (**MSP**-1) in SPf66, or increased infection due to heterologous parasites containing heterologous (alternative) **MSP**-1 sequences. Based on this 11 amino acid peptide (YSLFQKEKMVL), three forward primers (S,Q,V) were designed to amplify the **MSP**-1 sequence present in SPf66, and 3 additional forward primers (G,H,I) to amplify the alternative **MSP**-1 sequence (YGLFHKEKMIL). This strategy was validated by polymerase chain reaction (PCR) amplification and dideoxy sequencing with 14 cloned laboratory isolates, which demonstrated that each primer amplified one **MSP**-1 sequence or the other, but not both. The technique was then used to examine filter paper blots from an SPf66 **vaccine** study of 69 subjects in Saradidi, Kenya. In that study, the prevalence of infection with YSLFQKEKMVL or YGLFHKEKMIL type parasites was unaffected by immunization with SPf66 (based on PCR amplification with the S, Q, V, G, H and I primers, respectively). These results suggest that immunization with SPf66 does not produce a selective effect in vivo. They demonstrate a molecular method to test for selection in vivo as an indirect measure of **vaccine** efficacy.

L16 ANSWER 119 OF 195 MEDLINE on STN
AN 1999122378 MEDLINE
DN 99122378 PubMed ID: 9924990
TI Reduced amide pseudopeptide analogues of a malaria peptide possess secondary structural elements responsible for induction of functional antibodies which react with native proteins expressed in **Plasmodium falciparum** erythrocyte stages.
AU Lozano J M; Espejo F; Diaz D; Salazar L M; Rodriguez J; Pinzon C; Calvo J C; Guzman F; Patarroyo M E
CS Instituto de Inmunologia Hospital San Juan de Dios, Universidad Nacional

de Colombia, Bogota.. mepatarr@bacata.usc.unal.edu.co
SO JOURNAL OF PEPTIDE RESEARCH, (1998 Dec) 52 (6) 457-69.
Journal code: 9707067. ISSN: 1397-002X.
CY Denmark
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199904
ED Entered STN: 19990426
Last Updated on STN: 19990426
Entered Medline: 19990415
AB A psi[CH2NH] isoster bond was introduced by replacing one peptide bond at a time within the 1513 malaria peptide KEKMV motif to obtain a set of five pseudopeptides. The motif belongs to a **Plasmodium falciparum** malarial peptide coded 1513, derived from the **MSP**-1 protein. This high-binding motif included in the 1513 peptide is involved in the attachment of the malarial parasite to human erythrocytes. The novel malaria 1513 psi[CH2NH] surrogates were analyzed using RP-HPLC and MALDI-TOF mass spectrometry techniques. Nuclear magnetic resonance experiments allowed definition of the five pseudopeptide analogues' secondary structural features. Such structures are present in only a very few molecules in the 1513 parent peptide. A molecular model demonstrating the solution of the three-dimensional structure of the 1 513 peptide Pse-437 analogue was constructed on the basis of 1H-NMR spectral parameters. Monoclonal antibodies were generated to the five 1513 malaria peptide pseudopeptide analogues. These antibodies not only recognize the native **MSP**-1 (195 kDa) and its 83 kDa and 42 kDa proteolytic processing proteins but also different SPf(66)n malaria **vaccine** batches containing the native sequence. In addition, the mAbs were able to modify the kinetics of **Plasmodium falciparum** parasites' intraerythrocytic development and their ability to invade new RBCs. The presented evidence suggests that peptide bond-modified peptides could reproduce a transient state in 1513's native sequence and represent useful candidates in the development of a second generation of effective malarial **vaccines**

L16 ANSWER 120 OF 195 MEDLINE on STN
AN 1998233970 MEDLINE
DN 98233970 PubMed ID: 9574783
TI IgG3 antibodies to **Plasmodium falciparum merozoite surface protein** 2 (MSP2): increasing prevalence with age and association with clinical immunity to malaria.
AU Taylor R R; Allen S J; Greenwood B M; Riley E M
CS Institute of Cell, Animal and Population Biology, Division of Biological Sciences, University of Edinburgh, United Kingdom.
SO AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (1998 Apr) 58 (4) 406-13.
Journal code: 0370507. ISSN: 0002-9637.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199805
ED Entered STN: 19980514
Last Updated on STN: 20000303
Entered Medline: 19980507
AB In a cross-sectional survey carried out in west Africa (The Gambia), where **Plasmodium falciparum** malaria is endemic with seasonal transmission, 178 individuals 1-75 years of age were assessed for their antibody response to the malaria **vaccine** candidate, **merozoite surface protein** 2 (MSP2). Total IgG to recombinant antigens representing full-length, repetitive, and

group-specific domains of both allelic families of MSP2 was determined by ELISA. The IgG-subclass profile of IgG-positive sera was assessed. Antibody prevalence was age-dependent, reaching a peak during adolescence. In MSP2-seropositive individuals, there was a predominance of cytophilic antibodies (IgG1 and IgG3); IgG1 antibodies were prevalent in children less than 10 years of age, whereas in adolescents and adults MSP2-specific antibodies were predominantly IgG3. In parallel, we conducted a longitudinal study of children (3-8 years of age) from the same community; sera collected before the malaria transmission season were tested for the presence of anti-MSP2 antibodies. The subsequent susceptibility of these children to clinical malaria was monitored and the association between anti-MSP2 antibodies of different IgG subclasses and resistance to clinical malaria was tested. The presence of IgG3 antibodies to MSP2 serogroup A was negatively associated with the risk of clinical malaria whereas IgG1 antibodies to MSP2 serogroup B were associated with an increased risk of clinical infection. Our data suggest that age/exposure-related acquisition of IgG3 antibodies to MSP2 may contribute to the development of clinically protective immunity to malaria.

L16 ANSWER 121 OF 195 MEDLINE on STN
AN 2000455752 MEDLINE
DN 20379735 PubMed ID: 10923446
TI Molecular cloning and sequencing of genes encoding MSP2 isolates strains from two of **Plasmodium falciparum** from Chinese patients with cerebral malaria.
AU Bian Z; Song G; Zheng Z
CS Department of Parasitology, Second Military Medical University, Shanghai.
SO CHUNG-HUA I HSUEH TSA CHIH [CHINESE MEDICAL JOURNAL], (1998 May) 78 (5) 375-8.
Journal code: 7511141. ISSN: 0376-2491.
CY China
DT Journal; Article; (JOURNAL ARTICLE)
LA Chinese
FS Priority Journals
EM 200009
ED Entered STN: 20001005
Last Updated on STN: 20001005
Entered Medline: 20000926
AB OBJECTIVE: To provide the scientific evidence for designing safe and effective **vaccines** of human cerebral malaria. METHODS: Genomic DNA samples of two isolated **Plasmodium falciparum** isolate strains prepared directly from 5 cases of cerebral malaria patients' blood in mengla County, Yunnan Province (CMH/YN) and in Yingjiang County, Yunnan Province (CYJ/YN) were used for polymerase chain reaction (PCR) amplification and the two pairs of oligonucleotides for the highly conserved genes encoding FC27 **merozoite surface protein** 2 (MSP2) of Papua New Guinea strain of **Plasmodium falciparum** were used as primers. The PCR products were digested with BamH1 and Hind III respectively, and the generated fragment MSP2 were cloned into M13mp18 and M13mp19 vectors and their DNA was analyzed as the templates for DNA sequencing by the dideoxy chain-termination method. RESULTS: Compared with the published findings, FC27, K1, IC1 and CAMP sequences, DNA sequences of MSP2 from two isolated CMH/YN and CYJ/YN of **Plasmodium falciparum** strains from Chinese patients with cerebral malaria contained identical genes composed of 800 bp, encoding 264 amino acid, which were highly homologous up to 98.8% with that of FC27, K1 strain other than the IC1, CAMP strain. CONCLUSION: It is the first record of DNA sequencing of MSP2 determined from two isolated CMH/YN and CYJ/YN of **Plasmodium falciparum** strains from Chinese patients with cerebral malaria, MSP2 mutation may be one factor leading to the localized cerebral damage which causes clinical coma of human cerebral malaria.

L16 ANSWER 122 OF 195 MEDLINE on STN
AN 2000086347 MEDLINE
DN 20086347 PubMed ID: 10622635
TI A PCR method for molecular epidemiology of **Plasmodium falciparum Msp**-1.
AU Tanabe K; Sakihama N; Kaneko O; Saito-Ito A; Kimura M
CS Laboratory of Biology, Faculty of Engineering, Osaka Institute of Technology, Japan.
SO TOKAI JOURNAL OF EXPERIMENTAL AND CLINICAL MEDICINE, (1998 Dec) 23 (6) 375-81. Ref: 35
Journal code: 7704186. ISSN: 0385-0005.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 200002
ED Entered STN: 20000309
Last Updated on STN: 20000309
Entered Medline: 20000222
AB **Merozoite surface protein**-1 (**MSP**-1) of **Plasmodium falciparum** is a strong malaria **vaccine** candidate. However, **MSP**-1 exhibits extensive antigenic polymorphism, an issue which may compromise the development of effective **vaccine** based on this molecule. Since polymorphic nature of **MSP**-1 has not been fully understood in endemic areas of malaria, variation of the **MSP**-1 gene (**Msp**-1) must be studied in detail in natural parasite populations. Here, a PCR-based method for determination of P. falciparum **Msp**-1 haplotype is described, which can detect up to 24 different haplotypes per infected person. The method can be applied to various purposes of molecular epidemiology of not only **Msp**-1 haplotype but the genetic structure of P. falciparum populations.

L16 ANSWER 123 OF 195 MEDLINE on STN
AN 1998309458 MEDLINE
DN 98309458 PubMed ID: 9647243
TI A longitudinal study of type-specific antibody responses to **Plasmodium falciparum merozoite surface protein**-1 in an area of unstable malaria in Sudan.
AU Cavanagh D R; Elhassan I M; Roper C; Robinson V J; Giha H; Holder A A; Hviid L; Theander T G; Arnot D E; McBride J S
CS Institute of Cell, Animal and Population Biology, Division of Biological Sciences, University of Edinburgh, Scotland, United Kingdom.. cavanagh@srv0.bio.ed.ac.uk
SO JOURNAL OF IMMUNOLOGY, (1998 Jul 1) 161 (1) 347-59.
Journal code: 2985117R. ISSN: 0022-1767.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
OS GENBANK-AF034635; GENBANK-AF034636; GENBANK-AF034792
EM 199807
ED Entered STN: 19980716
Last Updated on STN: 19990129
Entered Medline: 19980709
AB **Merozoite surface protein**-1 (**MSP**-1) of **Plasmodium falciparum** is a malaria **vaccine** candidate Ag. Immunity to **MSP**-1 has been implicated in protection against infection in animal models. However, **MSP**-1 is a polymorphic protein and its immune recognition by

humans following infection is not well understood. We have compared the immunogenicity of conserved and polymorphic regions of **MSP**-1, the specificity of Ab responses to a polymorphic region of the Ag, and the duration of these responses in Sudanese villagers intermittently exposed to P. falciparum infections. Recombinant Ags representing the conserved N terminus (Block 1), the conserved C terminus, and the three main types of the major polymorphic region (Block 2) of **MSP**-1 were used to determine the specificity and longitudinal patterns of IgG Ab responses to **MSP**-1 in individuals. Abs from 52 donors were assessed before, during, and after malaria transmission seasons for 4 yr. Ags from the Block 1 region were rarely recognized by any donor. Responses to the C-terminal Ag occurred in the majority of acutely infected individuals and thus were a reliable indicator of recent clinical infection. Ags from the polymorphic Block 2 region of **MSP**-1 were recognized by many, although not all individuals after clinical malaria infections. Responses to Block 2 were type specific and correlated with PCR typing of parasites present at the time of infection. Responses to all of these Ags declined within a few months of drug treatment and parasite clearance, indicating that naturally induced human Ab responses to **MSP**-1 are short lived.

L16 ANSWER 124 OF 195 MEDLINE on STN
AN 1998319411 MEDLINE
DN 98319411 PubMed ID: 9657329
TI Predicted and observed alleles of **Plasmodium falciparum merozoite surface protein**-1 (**MSP**-1), a potential malaria **vaccine** antigen.
AU Qari S H; Shi Y P; Goldman I F; Nahlen B L; Tibayrenc M; Lal A A
CS Division of Parasitic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, GA, USA.. sxq0@cdc.gov
NC U01 AI37543-02 (NIAID)
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (1998 May 1) 92 (2) 241-52. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-AF040567; GENBANK-AF040568; GENBANK-AF040569
EM 199810
ED Entered STN: 19981029
Last Updated on STN: 19990129
Entered Medline: 19981022
AB The 19-kDa antigenic domain of **Plasmodium falciparum merozoite surface protein** (**MSP**)-1 is a potential malaria **vaccine** candidate. Based on the amino acid substitution, four known alleles, E-TSR (PNG-MAD20 type), E-KNG (Uganda-PA type), Q-KNG (Wellcome type), and Q-TSR (Indo type) of this domain have been identified. Using single or double crossover recombinational events, we predicted the existence of additional alleles of this antigen. The presence of the predicted alleles was determined in parasite isolates from western Kenya, by undertaking a cross-sectional and a longitudinal study. Of the ten predicted alleles, we have revealed the presence of three new alleles: E-KSG-L (Kenya-1 type); E-KSR-L (Kenya-2 type); and E-KNG-F (Kenya-3 type). The results of this study suggest that it may be possible to predict the complexity of the genetic makeup of natural parasite populations.

L16 ANSWER 125 OF 195 MEDLINE on STN
AN 1998084480 MEDLINE
DN 98084480 PubMed ID: 9423864
TI Temporal variation of the **merozoite surface protein**-2 gene of **Plasmodium falciparum**.

AU Eisen D; Billman-Jacobe H; Marshall V F; Fryauff D; Coppel R L
CS Department of Microbiology, Monash University, Clayton, Victoria, Australia.
SO INFECTION AND IMMUNITY, (1998 Jan) 66 (1) 239-46.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-U72948; GENBANK-U72949; GENBANK-U72950; GENBANK-U72951; GENBANK-U72952; GENBANK-U72953; GENBANK-U72954; GENBANK-U72955; GENBANK-U72956; GENBANK-U72957
EM 199801
ED Entered STN: 19980206
Last Updated on STN: 20000303
Entered Medline: 19980127
AB Extensive polymorphism of key parasite antigens is likely to hamper the effectiveness of subunit **vaccines** against **Plasmodium falciparum** infection. However, little is known about the extent of the antigenic repertoire of naturally circulating strains in different areas where malaria is endemic. To address this question, we conducted a study in which blood samples were collected from parasitemic individuals living within a small hamlet in Western Irian Jaya and subjected to PCR amplification using primers that would allow amplification of the gene encoding **merozoite surface protein**-2 (MSP2). We determined the nucleotide sequence of the amplified product and compared the deduced amino acid sequences to sequences obtained from samples collected in the same hamlet 29 months previously. MSP2 genes belonging to both major allelic families were observed at both time points. In the case of the FC27 MSP2 family, we observed that the majority of individuals were infected by parasites expressing the same form of MSP2. Infections with parasites expressing 3D7 MSP2 family alleles were more heterogeneous. No MSP2 alleles observed at the earlier time point were detectable at the later time point, either for the population as a whole or for individuals who were assayed at both time points. We examined a subset of the infected patients by using blood samples taken between the two major surveys. In no patients could we detect reinfection by a parasite expressing a previously encountered form of MSP2. Our results are consistent with the possibility that infection induces a form of strain-specific immune response against the MSP2 antigen that biases against reinfection by parasites bearing identical forms of MSP2.

L16 ANSWER 126 OF 195 MEDLINE on STN
AN 1998161713 MEDLINE
DN 98161713 PubMed ID: 9502606
TI A longitudinal investigation of IgG and IgM antibody responses to the **merozoite surface protein**-1 19-kiloDalton domain of **Plasmodium falciparum** in pregnant women and infants: associations with febrile illness, parasitemia, and anemia.
AU Branch O H; Udhayakumar V; Hightower A W; Oloo A J; Hawley W A; Nahlen B L; Bloland P B; Kaslow D C; Lal A A
CS Division of Parasitic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, USA.
SO AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (1998 Feb) 58 (2) 211-9.
Journal code: 0370507. ISSN: 0002-9637.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199803
ED Entered STN: 19980326

Last Updated on STN: 19990129
Entered Medline: 19980316

AB This study was aimed at delineating characteristics of naturally acquired immunity against the merozoite surface antigen-1 (**MSP**-1) of **Plasmodium falciparum**, a candidate malaria **vaccine** antigen. A case/control study was performed on 75 case/control pairs of infants with febrile illness at the time of the first detected infection indicating a clinical case. The presence and level of antibodies at one month prior to the first infection and at the time of the first infection in the afebrile group was significantly higher than in the febrile group. Decreased parasite density and decreased infection-related loss of hemoglobin was seen in infants with anti-**MSP**-1(19kD) IgG antibodies. In addition, mothers who were positive for the presence of these antibodies conferred protection against placental infection and infection in their infants. In this study, development of anti-**MSP**-1(19kD) antibody responses in 24 infants were studied longitudinally using monthly serum samples collected from birth until approximately one year of age. In addition, umbilical cord blood sera and respective mothers' sera were analyzed. Longitudinal studies of antibody responses revealed several short-lived IgG and IgM peaks throughout an infant's first year that correlated with detection of parasitemia. The protection against parasitemia and febrile illness was observed in infants when anti-**MSP**-1(19kD) antibodies were present; when infants were negative for IgG, they had a 10-times greater risk of becoming parasitemic. These data from a longitudinal and prospective study of malaria suggest a protective role for anti-**MSP**-1(19kD) antibodies in infants and pregnant women.

L16 ANSWER 127 OF 195 MEDLINE on STN
AN 1998250683 MEDLINE
DN 98250683 PubMed ID: 9584096
TI Genetic polymorphism and natural selection in the malaria parasite **Plasmodium falciparum**.
AU Escalante A A; Lal A A; Ayala F J
CS Division of Parasitic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, US Public Health Service, Chamblee, Georgia 30341, USA.
NC GM42397 (NIGMS)
SO GENETICS, (1998 May) 149 (1) 189-202.
Journal code: 0374636. ISSN: 0016-6731.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199807
ED Entered STN: 19980716
Last Updated on STN: 20020730
Entered Medline: 19980707

AB We have studied the genetic polymorphism at 10 **Plasmodium falciparum** loci that are considered potential targets for specific antimalarial **vaccines**. The polymorphism is unevenly distributed among the loci; loci encoding proteins expressed on the surface of the sporozoite or the merozoite (AMA-1, CSP, LSA-1, **MSP**-1, **MSP**-2, and **MSP**-3) are more polymorphic than those expressed during the sexual stages or inside the parasite (EBA-175, Pfs25, PF48/45, and RAP-1). Comparison of synonymous and nonsynonymous substitutions indicates that natural selection may account for the polymorphism observed at seven of the 10 loci studied. This inference depends on the assumption that synonymous substitutions are neutral, which we test by analyzing codon bias and G+C content in a set of 92 gene loci. We find evidence for an overall trend towards increasing A+T richness, but no evidence for mutation bias. Although the neutrality of synonymous substitutions is not definitely established, this trend towards an A+T

rich genome cannot explain the accumulation of substitutions at least in the case of four genes (AMA-1, CSP, LSA-1, and PF48/45) because the Gleft and right arrow C transversions are more frequent than expected. Moreover, the Tajima test manifests positive natural selection for the **MSP**-1 and, less strongly, **MSP**-3 polymorphisms; the McDonald-Kreitman test manifests natural selection at LSA-1 and PF48/45. We conclude that there is definite evidence for positive natural selection in the genes encoding AMA-1, CSP, LSA-1, **MSP**-1, and Pfs48/45. For four other loci, EBA-175, **MSP**-2, **MSP**-3, and RAP-1, the evidence is limited. No evidence for natural selection is found for Pfs25.

L16 ANSWER 128 OF 195 MEDLINE on STN
AN 1998233576 MEDLINE
DN 98233576 PubMed ID: 9572049
TI Immune responses to **Plasmodium falciparum** antigens during a malaria **vaccine** trial in Tanzanian children.
AU Alonso P L; Lopez M C; Bordmann G; Smith T A; Aponte J J; Weiss N A; Urassa H; Armstrong-Schellenberg J R; Kitua A Y; Masanja H; Thomas M C; Oettli A; Hurt N; Hayes R; Kilama W L; Tanner M
CS Unidad de Epidemiologia y Bioestadistica, Hospital Clinic, Barcelona, Spain.
SO PARASITE IMMUNOLOGY, (1998 Feb) 20 (2) 63-71.
Journal code: 7910948. ISSN: 0141-9838.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199805
ED Entered STN: 19980514
Last Updated on STN: 19980514
Entered Medline: 19980507
AB Among Tanzanian children living in an area of intense and perennial malaria transmission, prevalence of naturally acquired IgG antibodies that recognize SPf66, NANP, p190 and a 19 kDa fragment of the **merozoite surface protein**-1 (**MSP**-1) is high and increases with age. This possibly reflects the high level of natural exposure of the children to P. falciparum. The prevalences of IgG antibodies that recognize the three putative merozoite derived sequences contained in the malaria **vaccine** SPf66 (83.1, 55.1 and 35.1) is low but also show some age dependence. Three doses of the SPf66 **vaccine** induce a strong IgG antibody response against both the SPf66 construct, NANP and the three individual peptides. Vaccination with SPf66 did not result in an increase of anti19 kDa fragment antibodies. This reflects the specificity of the humoral immune response induced by the SPf66 construct. Among vaccinated children, antibody titres against SPf66 decreased over time following the third dose. However, 18 months after the third dose, SPf66 recipients still had significantly higher IgG titres and stimulation indices of peripheral blood mononuclear cells (PBMC) than placebo recipients. Within the **vaccine** group, there is a trend for increasing anti-SPf66 IgG titre to be associated with decreasing risk of clinical malaria but this was not statistically significant. Results also show the difficulties of establishing whether antibody responses are related to protection in field trials in endemic areas.

L16 ANSWER 129 OF 195 MEDLINE on STN
AN 97378069 MEDLINE
DN 97378069 PubMed ID: 9234750
TI Comparison of protection induced by immunization with recombinant proteins from different regions of **merozoite surface protein** 1 of Plasmodium yoelii.
AU Tian J H; Kumar S; Kaslow D C; Miller L H

CS Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland 20892, USA.
SO INFECTION AND IMMUNITY, (1997 Aug) 65 (8) 3032-6.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199708
ED Entered STN: 19970825
Last Updated on STN: 19990129
Entered Medline: 19970814
AB Vaccination with native full-length **merozoite surface protein** 1 (MSP1) or with recombinant C-terminal peptides protects mice against lethal challenge with virulent malaria parasites. To determine whether other regions of MSP1 can also induce protection, Plasmodium yoelii MSP1 was divided into four separate regions. Each was expressed in Escherichia coli as a fusion protein with glutathione S-transferase (GST). The N-terminal fragment began after the cleavage site for the signal sequence and ended in the region comparable to the cleavage site for the C terminus of the 82-kDa peptide of **Plasmodium falciparum**. This expressed protein was 30 kDa smaller than the predicted peptide. One peptide from the middle region was produced, and the C terminus consisted of a 42-kDa fragment corresponding to the analogous peptide of P. falciparum and a 19-kDa fragment that extended 37 amino acids in the amino-terminal direction beyond the probable cleavage site. To test protection of mice against lethal P. yoelii challenge, three mouse strains (CAF1, BALB/c, and A/J) were vaccinated with each of the four recombinant proteins of MSP1. Mice vaccinated with the C-terminal 19-kDa protein were highly protected (described previously), as were those vaccinated with the 42-kDa protein that contained the 19-kDa fragment. The N-terminally expressed fragment of P. yoelii was not full length because of proteolytic cleavage in E. coli. The GST-82-kDa partial fragments induced some immunity, but the surviving mice still had high parasitemias. Vaccination with the peptide from the middle region of MSP1 gave minimal to no protection. Therefore, in addition to the C-terminal 19- and 42-kDa proteins, the only other fragment to give protection was the 82-kDa protein. The protection induced by the truncated 82-kDa protein was minimal compared with that of the C-terminal fragments.

L16 ANSWER 130 OF 195 MEDLINE on STN
AN 1998031942 MEDLINE
DN 98031942 PubMed ID: 9362529
TI Antibodies that inhibit malaria **merozoite surface protein**-1 processing and erythrocyte invasion are blocked by naturally acquired human antibodies.
AU Guevara Patino J A; Holder A A; McBride J S; Blackman M J
CS Division of Parasitology, National Institute for Medical Research, London, United Kingdom.
SO JOURNAL OF EXPERIMENTAL MEDICINE, (1997 Nov 17) 186 (10) 1689-99.
Journal code: 2985109R. ISSN: 0022-1007.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199712
ED Entered STN: 19980109
Last Updated on STN: 20000303
Entered Medline: 19971203
AB **Merozoite surface protein**-1 (**MSP**-1) of the human malaria parasite **Plasmodium falciparum**

undergoes at least two endoproteolytic cleavage events during merozoite maturation and release, and erythrocyte invasion. We have previously demonstrated that mAbs which inhibit erythrocyte invasion and are specific for epitopes within a membrane-proximal, COOH-terminal domain of **MSP**-1 (**MSP**-119) prevent the critical secondary processing step which occurs on the surface of the extracellular merozoite at around the time of erythrocyte invasion. Certain other anti-**MSP**-119 mAbs, which themselves inhibit neither erythrocyte invasion nor **MSP**-1 secondary processing, block the processing-inhibitory activity of the first group of antibodies and are termed blocking antibodies. We have now directly quantitated antibody-mediated inhibition of **MSP**-1 secondary processing and invasion, and the effects on this of blocking antibodies. We show that blocking antibodies function by competing with the binding of processing-inhibitory antibodies to their epitopes on the merozoite. Polyclonal rabbit antibodies specific for certain **MSP**-1 sequences outside of **MSP**-119 also act as blocking antibodies. Most significantly, affinity-purified, naturally acquired human antibodies specific for epitopes within the NH2-terminal 83-kD domain of **MSP** -1 very effectively block the processing-inhibitory activity of the anti-**MSP**-119 mAb 12.8. The presence of these blocking antibodies also completely abrogates the inhibitory effect of mAb 12.8 on erythrocyte invasion by the parasite in vitro. Blocking antibodies therefore (a) are part of the human response to malarial infection; (b) can be induced by **MSP**-1 structures unrelated to the **MSP**-119 target of processing-inhibitory antibodies; and (c) have the potential to abolish protection mediated by anti-**MSP**-119 antibodies. Our results suggest that an effective **MSP**-119-based falciparum malaria **vaccine** should aim to induce an antibody response that prevents **MSP**-1 processing on the merozoite surface.

L16 ANSWER 131 OF 195 MEDLINE on STN
AN 97448325 MEDLINE
DN 97448325 PubMed ID: 9302735
TI Addition of the MSA1 signal and anchor sequences to the malaria merozoite surface antigen 1 C-terminal region enhances immunogenicity when expressed by recombinant vaccinia virus.
AU Yang S; Carroll M W; Torres-Duarte A P; Moss B; Davidson E A
CS Department of Biochemistry and Molecular Biology, Georgetown University Medical Center, NW Washington, DC 20007, USA.
SO VACCINE, (1997 Aug-Sep) 15 (12-13) 1303-13.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-X02919
EM 199710
ED Entered STN: 19971105
Last Updated on STN: 19990129
Entered Medline: 19971023
AB Genes encoding four different C-terminal fragments of a **Plasmodium falciparum** merozoite surface antigen were generated: MSA1C-(Si,A), containing signal and anchor regions of MSA1; MSA1C-(Si,nA), containing the signal but not the anchor; MSA1C-(nSi,A), containing the anchor but not the signal, and MSA1C-(nSi,nA) containing neither the signal nor the anchor region. Each gene was inserted into the thymidine kinase region of vaccinia virus, under the control of a synthetic strong early/ late promoter. When the plasmodial genes were expressed in cells infected by the recombinant vaccinia virus, the two proteins containing the signal region were transported to the surface of infected cells. Infection of mice and rabbits with the latter recombinant viruses stimulated C-terminal-specific antibody levels that were 10-80-fold higher than those

induced by the two recombinant viruses without the signal region. The combination of the signal and anchor regions with the C-terminal MSA1 protein also generated the most effective neutralization in a P. falciparum invasion assay.

L16 ANSWER 132 OF 195 MEDLINE on STN
AN 97405281 MEDLINE
DN 97405281 PubMed ID: 9261951
TI Selection of an adjuvant for vaccination with the malaria antigen, MSA-2.
AU Pye D; Vandenberg K L; Dyer S L; Irving D O; Goss N H; Woodrow G C; Saul A; Alving C R; Richards R L; Ballou W R; Wu M J; Skoff K; Anders R F
CS CSL Ltd., Parkville, Vic., Australia.
SO VACCINE, (1997 Jun) 15 (9) 1017-23.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199710
ED Entered STN: 19971021
Last Updated on STN: 20000303
Entered Medline: 19971008
AB Various formulations of the **Plasmodium falciparum** merozoite surface antigen, MSA-2, were made and tested in animals in order to select one for use in human **vaccine** trials. Recombinant constructs representing both major allelic forms of MSA-2 were formulated with a range of adjuvants and used to immunize rabbits, mice and sheep. After immunization, antibody responses obtained with the most potent adjuvants were at least tenfold greater than responses obtained with the least potent adjuvant Alhydrogel, which was used as the reference standard, although its lower potency indicated against its further use in clinical trials. Based on broadly similar results obtained with the three animal species, several adjuvants, including the water-in-oil adjuvant Montanide ISA 720, the oil-in-water adjuvant SAF-1, and liposomes containing lipid A formulated with Alhydrogel were demonstrated to be potent and potentially suitable for the clinical evaluation of MSA-2 as a candidate malaria **vaccine** antigen. Of these, ISA 720 was selected for further trial.

L16 ANSWER 133 OF 195 MEDLINE on STN
AN 97240690 MEDLINE
DN 97240690 PubMed ID: 9086150
TI Analysis of multiple **Plasmodium falciparum** infections in Tanzanian children during the phase III trial of the malaria **vaccine** SPf66.
AU Beck H P; Felger I; Huber W; Steiger S; Smith T; Weiss N; Alonso P; Tanner M
CS Swiss Tropical Institute, Basel.
SO JOURNAL OF INFECTIOUS DISEASES, (1997 Apr) 175 (4) 921-6.
Journal code: 0413675. ISSN: 0022-1899.
CY United States
DT (CLINICAL TRIAL)
(CLINICAL TRIAL, PHASE III)
Journal; Article; (JOURNAL ARTICLE)
(RANDOMIZED CONTROLLED TRIAL)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199704
ED Entered STN: 19970424
Last Updated on STN: 20000303
Entered Medline: 19970417
AB In the first phase III efficacy trial of the malaria **vaccine** SPf66 in Africa, MOIs in SPf66- and placebo-vaccinated children were

analyzed by polymerase chain reaction-restriction fragment length polymorphism of the **Plasmodium falciparum** merozoite surface antigen 2 (MSA2). MOIs were significantly reduced in asymptomatic **vaccine** recipients compared with those in asymptomatic placebo recipients; however, no differences were observed among symptomatic children in the **vaccine** and control groups. These results show that immunization with SPf66 modulates the course of naturally occurring infections, as reflected by reduced MOIs. In placebo recipients, however, there was a significant negative correlation between numbers of infecting genotypes, as identified by MSA2, and morbidity. Asymptomatic placebo recipients had an average of 5 concurrent infections, whereas children with clinical cases had an average of 3.4 infections. These data provide further evidence that premunition from concurrent infections is important in immunity against clinical malaria. No such effect of multiple infections was found in the vaccinated group.

L16 ANSWER 134 OF 195 MEDLINE on STN
AN 1998156759 MEDLINE
DN 98156759 PubMed ID: 9497045
TI **Merozoite surface protein**-1 epitopes recognized by antibodies that inhibit **Plasmodium falciparum** merozoite dispersal.
AU Lyon J A; Carter J M; Thomas A W; Chulay J D
CS Department of Immunology, Walter Reed Army Institute of Research, Washington, DC 20307-5100, USA.. Dr._Jeff_Lyon@WRSMTP-CCMAIL.Army.mil
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (1997 Dec 1) 90 (1) 223-34. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199804
ED Entered STN: 19980430
Last Updated on STN: 19990129
Entered Medline: 19980423
AB Serum antibodies from malaria immune donors can inhibit merozoite dispersal by forming immune complexes through surface-accessible regions of membrane associated antigens. Such merozoite forms are referred to as immune clusters of merozoites (ICM). Antibodies dissociated from ICM of **Plasmodium falciparum** identify a restricted subset of antigens, including **merozoite surface protein** -1 (**MSP**-1). We performed epitope mapping by comparing the reactivity of whole immune sera and ICM-derived antibodies in immunoblotting assays, using fourteen overlapping recombinant **MSP** -1 fragments, and by ELISA, using each of the 1720 octapeptides encoded within **MSP**-1. Antibodies in immune sera reacted with thirteen recombinant fragments and hundreds of octapeptides, but antibodies derived from ICM reacted with only six recombinant fragments and twenty octapeptides. Recombinant fragment recognition by ICM-derived antibodies was delimited to three regions 150-200 residues long, with seven of the octapeptide epitopes also mapping to these regions. The octapeptides recognized most strongly by antibodies in whole serum corresponded to the degenerate repeats near the N-terminus of **MSP**-1, however, neither recombinant fragments, nor octapeptides containing these degenerate repeats, were recognized by ICM-derived antibodies. Compared to reactions with recombinant fragments, the reactions observed with octapeptides were weak and may represent low-affinity mimetopes or cross-reactions. Alternatively, they may represent reactions with a portion of an epitope assembled from more than one non-contiguous peptide. These results suggest that ICM-derived antibodies can be used to map surface-accessible epitopes on **MSP**-1 and that the recombinant fragments with which they react are appropriate candidates for further evaluation as components of a malaria **vaccine**.

L16 ANSWER 135 OF 195 MEDLINE on STN
AN 1999044369 MEDLINE
DN 99044369 PubMed ID: 9827130
TI [Specific antibodies against **Plasmodium falciparum** antigens in immune subjects: II. Screening of responses against the merozoite major surface antigen (**MSP**!)].
Anticorps specifiques d'antigenes de **Plasmodium falciparum** chez les sujets immuns: II. Criblage des reponses vis a vis d'un antigene majeur de la surface des merozoites (MSP1).
AU Nguer C M; Diouf A; Diallo T O; Dieye A; Tall A; Diouf B; Molez J F; Trape J F; Perraut R; Garraud O
CS Unite d'Immunologie, Institut Pasteur de Dakar, Senegal.
SO DAKAR MEDICAL, (1997) 42 (2) 106-10.
Journal code: 7907630. ISSN: 0049-1101.
CY Senegal
DT Journal; Article; (JOURNAL ARTICLE)
LA French
FS Priority Journals
EM 199812
ED Entered STN: 19990115
Last Updated on STN: 19990115
Entered Medline: 19981230
AB Specific immune responses to asexual blood stages of P. falciparum antigens (a lysate of parasitized red blood cells and a characterized **vaccine** candidate i.e. MSP1 p19) were analyzed in plasma samples from immune adult individuals living in three different areas of Senegal, where malaria transmission is different. Most individuals in the three sites had specific IgG and IgM to total P. falciparum antigens, whereas approximately 50% had either IgG or IgM specific to MSP1 p19. Further, no anti-MSP1 p19 IgG2 and IgG4 antibody was noticed in any individual whereas the distribution of anti-MSP1 p19 IgG1 and IgG3 was different upon the epidemiological context. In addition, no relationship was found between antibody responses and in vitro T cell responses against P. falciparum antigens upon those experimental conditions. These data stress on the relatively elevated distribution of specific antibodies to MSP1 p19 in P. falciparum hyperendemic areas and suggest a differential regulation of isotypes depending on individual parasite exposure.

L16 ANSWER 136 OF 195 MEDLINE on STN
AN 97293267 MEDLINE
DN 97293267 PubMed ID: 9149240
TI **Plasmodium falciparum**: allelic variation in the **merozoite surface protein** 1 gene in wild isolates from southern Vietnam.
AU Kaneko O; Kimura M; Kawamoto F; Ferreira M U; Tanabe K
CS Department of Medical Zoology, Osaka City University Medical School, Japan.
SO EXPERIMENTAL PARASITOLOGY, (1997 May) 86 (1) 45-57.
Journal code: 0370713. ISSN: 0014-4894.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-D86292; GENBANK-D86293; GENBANK-D86294; GENBANK-D86295; GENBANK-D86296
EM 199705
ED Entered STN: 19970602
Last Updated on STN: 19990129
Entered Medline: 19970522
AB Allelic variation in the **Plasmodium falciparum** **merozoite surface protein** 1 (MSP1) gene is expressed as an association of allelic types in variable blocks. In this

study, a PCR strategy that can detect 24 different MSP1 association types was used to investigate allelic variation in the MSP1 gene. We identified 236 distinct association type clones in 136 wild isolates collected from southern Vietnam, analysis of which revealed that (1) recombination between two representative allelic types in the central part of the MSP1 gene did not exist, (2) frequency distribution of MSP1 association types did not differ in different population groups, and (3) particular MSP1 association types were predominant. Statistical analysis for the association of allelic types indicated significant, nonrandom associations between blocks 4 and 6 but not between blocks 2 and 4, and 2 and 6. These results suggest that selection operates in favor of particular MSP1 association types. In addition, direct sequencing of 31 isolates confirmed reported sequence substitutions in the C-terminal 19-kDa Cys-rich region of MSP1, supporting a notion of limited variations in this region, a strong **vaccine** candidate molecule.

L16 ANSWER 137 OF 195 MEDLINE on STN
AN 97447586 MEDLINE
DN 97447586 PubMed ID: 9303326
TI Epitope analysis of human T-cell response to **MSP**-1 of **Plasmodium falciparum** in malaria-nonexposed individuals.
AU Ohta N; Iwaki K; Itoh M; Fu J; Nakashima S; Hato M; Tolle R; Bujard H; Saitoh A; Tanabe K
CS Department of Medical Zoology, Nagoya City University Medical School, Nagoya, Japan.. nohta@med.nagoya-cu.ac.jp
SO INTERNATIONAL ARCHIVES OF ALLERGY AND IMMUNOLOGY, (1997 Sep) 114 (1) 15-22.
Journal code: 9211652. ISSN: 1018-2438.
CY Switzerland
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199710
ED Entered STN: 19971024
Last Updated on STN: 19990129
Entered Medline: 19971010
AB BACKGROUND: **MSP**-1 of **Plasmodium falciparum** induces strong proliferative T cell responses even in malaria-nonexposed individuals. Epitopes recognized by malaria-nonimmune T cells have not been identified, and immunological mechanisms inducing such T cell responses remain to be uncovered. **MSP**-1 is a **vaccine** candidate, and it should be understood whether those epitopes have any roles in **MSP**-1-mediated protective immunity. The T epitopes-inducing malaria-naive T cell response was analyzed in the hope of understanding the underlying mechanisms. METHODS: Human T cell lines and clones reactive to **MSP**-1 of P. falciparum were established from malaria-nonexposed Japanese donors in vitro, and epitope peptides were identified. Sequences of those epitope peptides were compared to unrelated peptides in the data base. One of those peptides was tested for both binding to HLA-DR molecules and inducing proliferative responses of **MSP**-1-reactive T cells. RESULTS: There are at least 6 epitopes recognized by malaria-naive T cells under the restriction by HLA-DRB1*1502 or 0802. Important amino acids for the T cell recognition were identified for an **MSP**-1 peptide. A yeast peptide which shared those residues induced proliferative responses of **MSP**-1-reactive T cells. CONCLUSION: We identified T epitopes in the N-terminal region of **MSP**-1, some of which showed molecular similarities with unrelated environmental antigens, suggesting the presence of cross-reactive T epitopes in **MSP**-1. Cytokine production in response to those epitopes suggests regulatory functions of those T cells during primary infection with P. falciparum.

L16 ANSWER 138 OF 195 MEDLINE on STN

AN 1998099046 MEDLINE
DN 98099046 PubMed ID: 9436461
TI Human T-cell recognition of synthetic peptides representing conserved and variant sequences from the **merozoite surface protein** 2 of **Plasmodium falciparum**.
AU Theander T G; Hviid L; Dodoo D; Afari E A; Jensen J B; Rzepczyk C M
CS Centre for Medical Parasitology, University of Copenhagen, Denmark.. parasite@biobase.dk
NC AI-16312 (NIAID)
SO IMMUNOLOGY LETTERS, (1997 Jun) 58 (1) 1-8.
Journal code: 7910006. ISSN: 0165-2478.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199802
ED Entered STN: 19980224
Last Updated on STN: 20000303
Entered Medline: 19980211
AB **Merozoite surface protein** 2 (MSP2) is a malaria **vaccine** candidate currently undergoing clinical trials. We analyzed the peripheral blood mononuclear cell (PBMC) response to synthetic peptides corresponding to conserved and variant regions of the FCQ-27 allelic form of MSP2 in Ghanaian individuals from an area of hyperendemic malaria transmission and in Danes without exposure to malaria. PBMC from 20-39% of Ghanaians responded to each of the peptides by proliferation and 29-36% had PBMC which produced interferon-gamma (IFN-gamma) in response to peptide stimulation. In Danes, there was no proliferation to two of the peptides and only PBMC from 5% of the individuals proliferated to the other three peptides. IFN-gamma production was not detected to any peptide. In both Danes and Ghanaians in only a few instances was IL-4 detected in the PBMC cultures. Overall, PBMC from 79% of the Ghanaians responded by proliferation and/or cytokine secretion to at least one of three peptides tested, whereas responses were only observed in 14% of Danes (P = 0.002). These data suggest that the Ghanaians had expanded peripheral blood T-cell populations recognizing the peptides as a result of natural infection. The findings are encouraging for the development of a **vaccine** based on these T-epitope containing regions of MSP2, as the peptides were broadly recognized suggesting that they can bind to diverse HLA alleles and also because they include conserved MSP2 sequences. Immunisation with a **vaccine** construct incorporating the sequences present in these peptides could thus be expected to be immunogenic in a high percentage of individuals and lead to the establishment of memory T-cells, which can be boosted through natural infection.

L16 ANSWER 139 OF 195 MEDLINE on STN
AN 96230350 MEDLINE
DN 96230350 PubMed ID: 8785480
TI Glycobiology of **Plasmodium falciparum**: an emerging area of research.
AU Hoessli D C; Davidson E A; Schwarz R T; Nasir-ud-Din
SO GLYCOCONJUGATE JOURNAL, (1996 Feb) 13 (1) 1-3. Ref: 33
Journal code: 8603310. ISSN: 0282-0080.
CY ENGLAND: United Kingdom
DT Letter
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 199609
ED Entered STN: 19961008
Last Updated on STN: 19990129

Entered Medline: 19960920

L16 ANSWER 140 OF 195 MEDLINE on STN
AN 96355898 MEDLINE
DN 96355898 PubMed ID: 8751936
TI NYVAC-Pf7: a poxvirus-vectored, multiantigen, multistage **vaccine** candidate for **Plasmodium falciparum** malaria.
AU Tine J A; Lanar D E; Smith D M; Wellde B T; Schultheiss P; Ware L A; Kauffman E B; Wirtz R A; De Taisne C; Hui G S; Chang S P; Church P; Hollingdale M R; Kaslow D C; Hoffman S; Guito K P; Ballou W R; Sadoff J C; Paoletti E
CS Virogenetics Corporation, Troy, New York 12180, USA.
SO INFECTION AND IMMUNITY, (1996 Sep) 64 (9) 3833-44.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-U65407
EM 199610
ED Entered STN: 19961015
Last Updated on STN: 19970203
Entered Medline: 19961003
AB The highly attenuated NYVAC vaccinia virus strain has been utilized to develop a multiantigen, multistage **vaccine** candidate for malaria, a disease that remains a serious global health problem and for which no highly effective **vaccine** exists. Genes encoding seven **Plasmodium falciparum** antigens derived from the sporozoite (circumsporozoite protein and sporozoite surface protein 2), liver (liver stage antigen 1), blood (**merozoite surface protein** 1, serine repeat antigen, and apical membrane antigen 1), and sexual (25-kDa sexual-stage antigen) stages of the parasite life cycle were inserted into a single NYVAC genome to generate NYVAC-Pf7. Each of the seven antigens was expressed in NYVAC-Pf7-infected culture cells, and the genotypic and phenotypic stability of the recombinant virus was demonstrated. When inoculated into rhesus monkeys, NYVAC-Pf7 was safe and well tolerated. Antibodies that recognize sporozoites, liver, blood, and sexual stages of P. falciparum were elicited. Specific antibody responses against four of the P.falciparum antigens (circumsporozoite protein, sporozoite surface protein 2, **merozoite surface protein** 1, and 25-kDa sexual-stage antigen) were characterized. The results demonstrate that NYVAC-Pf7 is an appropriate candidate **vaccine** for further evaluation in human clinical trials.

L16 ANSWER 141 OF 195 MEDLINE on STN
AN 96355869 MEDLINE
DN 96355869 PubMed ID: 8751907
TI Immunization of Aotus nancymai with recombinant C terminus of **Plasmodium falciparum merozoite surface protein** 1 in liposomes and alum adjuvant does not induce protection against a challenge infection.
AU Burghaus P A; Wellde B T; Hall T; Richards R L; Egan A F; Riley E M; Ballou W R; Holder A A
CS Division of Parasitology, National Institute for Medical Research, London, United Kingdom.
SO INFECTION AND IMMUNITY, (1996 Sep) 64 (9) 3614-9.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199610
ED Entered STN: 19961015

Last Updated on STN: 19990129
Entered Medline: 19961003

AB **Merozoite surface protein** 1 (**MSP**-1) of **Plasmodium falciparum** is an antimalarial **vaccine** candidate. The highly conserved 19-kDa C-terminal processing fragment of **MSP**-1 (**MSP**-1(19)) is of particular interest since it contains epitopes recognized by monoclonal antibodies which inhibit the invasion of erythrocytes in vitro. The presence of naturally acquired anti-**MSP**-1(19) antibodies in individuals exposed to malaria has been correlated with reduced morbidity, and immunization with an equivalent recombinant P. yoelii antigen induces substantial protection against this parasite in mice. We have expressed P. falciparum **MSP**-1(19) in Escherichia coli as a correctly folded protein and immunized Aotus nancymai monkeys by using the protein incorporated into liposomes and adsorbed to alum. After vaccination, the sera from these animals contained anti-**MSP**-1(19) antibodies, some of which competed for binding to **MSP**-1(19) with monoclonal antibodies that inhibit parasite invasion of erythrocytes in vitro. However, after challenge with either a homologous or a heterologous strain of parasite, all animals became parasitemic and required treatment. The immunization did not induce protection in this animal model.

L16 ANSWER 142 OF 195 MEDLINE on STN
AN 96294785 MEDLINE
DN 96294785 PubMed ID: 8698500
TI Natural immune response to the C-terminal 19-kilodalton domain of **Plasmodium falciparum merozoite surface protein** 1.
AU Shi Y P; Sayed U; Qari S H; Roberts J M; Udhayakumar V; Oloo A J; Hawley W A; Kaslow D C; Nahlen B L; Lal A A
CS Division of Parasitic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia 30341, USA.
NC AI37543-01 (NIAID)
SO INFECTION AND IMMUNITY, (1996 Jul) 64 (7) 2716-23.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199609
ED Entered STN: 19960912
Last Updated on STN: 19990129
Entered Medline: 19960904

AB We have characterized the natural immune responses to the 19-kDa domain of **merozoite surface protein** 1 in individuals from an area of western Kenya in which malaria is holoendemic. We used the three known natural variant forms of the yeast-expressed recombinant 19-kDa fragment that are referred to as the E-KNG, Q-KNG, and E-TSR antigens. T-cell proliferative responses in individuals older than 15 years and the profile of immunoglobulin G (IgG) antibody isotypes in individuals from 2 to 74 years old were determined. Positive proliferative responses to the Q-KNG antigen were observed for 54% of the individuals, and 37 and 35% of the individuals responded to the E-KNG and E-TSR constructs, respectively. Considerable heterogeneity in the T-cell proliferative responses to these three variant antigens was observed in different individuals, suggesting that the 19-kDa antigen may contain variant-specific T epitopes. Among responses of the different isotypes of the IgG antibody, IgG1 and IgG3 isotype responses were predominant, and the prevalence and levels of the responses increased with age. We also found that a higher level of IgG1 antibody response correlated with lower parasite density among young age groups, suggesting that IgG1 antibody response may play a role in protection against malaria. However, there was no correlation between the IgG3 antibody level and protection.

Furthermore, we observed that although the natural antibodies cross-reacted with all three variant 19-kDa antigens, IgG3 antibodies in 12 plasma samples recognized only the E-KNG and Q-KNG constructs and not the E-TSR antigen. This result suggests that the fine specificity of IgG3 antibodies differentiates among variant-specific natural B-cell determinants in the second epidermal growth factor domain (KNG and TSR) of the antigen.

L16 ANSWER 143 OF 195 MEDLINE on STN
AN 96201554 MEDLINE
DN 96201554 PubMed ID: 8613353
TI Dominance of conserved B-cell epitopes of the **Plasmodium falciparum merozoite surface protein**, MSP1, in blood-stage infections of naive Aotus monkeys.
AU Hui G S; Nikaido C; Hashiro C; Kaslow D C; Collins W E
CS Department of Tropical Medicine, University of Hawaii, Honolulu, Hawaii 96816, USA.. ghui@hawaii.edu
NC AI30589 (NIAID)
SO INFECTION AND IMMUNITY, (1996 May) 64 (5) 1502-9.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199606
ED Entered STN: 19960613
Last Updated on STN: 19990129
Entered Medline: 19960606
AB We have shown that conserved B epitopes were immunodominant in animals hyperimmunized with parasite-purified or recombinant **merozoite surface protein** MSP1 of **Plasmodium falciparum**. Cross-priming studies also suggested that a conserved T-helper epitope(s) is efficient in inducing the anti-MSP1 antibody response. In this study, we determined whether a similar profile of immune responses was induced during live P. falciparum infections. Naive Aotus monkeys were infected by blood-stage challenge with either one of the two dimorphic MSP1 alleles represented by the FUP and FVO parasites. Sera collected after parasite clearance were analyzed by enzyme-linked immunosorbent assays (ELISAs). Monkeys infected with parasites carrying one allelic form of MSP1 had antibodies that were equally reactive with homologous or heterologous MSP1s. This preferential recognition of conserved epitopes of MSP1 was confirmed by competitive binding ELISAs. Studies with Plasmodium yoelii and P. falciparum show that the C-terminal 19-kDa fragment of MSP1, MSP1(19), is the target of protective immunity. Thus, monkey sera were assayed for recognition with recombinant MSP1(19)s expressing variant and conserved B epitopes. Results of direct and competitive binding ELISAs showed that the anti-MSP1(19) antibodies were also directed primarily against conserved determinants. The similarities between **vaccine**- or infection-induced antibody responses suggest a possible reciprocal enhancement of the two populations of anti-MSP1 antibodies when a subunit MSP1 **vaccine** is introduced into populations living in areas where malaria is endemic. This together with previous observations that conserved determinants are important in MSP1-mediated immunity provides an optimistic outlook that a subunit MSP1 **vaccine** may be effective and practical for field applications in malaria-exposed populations.

L16 ANSWER 144 OF 195 MEDLINE on STN
AN 96338183 MEDLINE
DN 96338183 PubMed ID: 8757623
TI Genetic regulation of protective immune response in congenic strains of mice vaccinated with a subunit malaria **vaccine**.
AU Tian J H; Miller L H; Kaslow D C; Ahlers J; Good M F; Alling D W;

Berzofsky J A; Kumar S
CS Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD 20892, USA.
SO JOURNAL OF IMMUNOLOGY, (1996 Aug 1) 157 (3) 1176-83.
Journal code: 2985117R. ISSN: 0022-1767.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199609
ED Entered STN: 19961008
Last Updated on STN: 19990129
Entered Medline: 19960926
AB The C-terminal 19-kDa, epidermal growth factor-like region of the **merozoite surface protein** 1 (MSP1) has been used as a **vaccine** to induce protective immunity to Plasmodium yoelii in mice and to **Plasmodium falciparum** in monkeys. To analyze the mechanisms and genetic regulation of this MSP1 **vaccine**-induced protection, we studied the immunologic correlates of protection in H-2 recombinant and congenic mouse strains on the B10 background. Multiple H-2-linked loci were found to contribute, each with a different mechanism. One locus mapped to the I-A region based on the strong protection in C57BL/10 mice compared with intermediate protection in B10.A(4R) mice and the lack of a difference between B10.AKM and B10.MBR mice. Differences in efficacy of passively transferred antisera from vaccinated C57BL/10 vs B10.A(4R) mice indicated that the protection regulated by the I-A locus was at least in part Ab dependent. Two loci mapped to the right of I-A (FE, H-2S, or H-2D) based on a correlation with the number of H-2k loci to the right of I-A in mice that were I-Ak. One effect was Ab independent and may correspond to a possible negative effect of the I-Ek locus. T cells from protected and nonprotected strains differed in their production of IFN-gamma and TNF-alpha following immunization with MSP1(19), but it was unclear how the differential patterns of cytokine expression related to the level of protection. Thus, MSP1(19) **vaccine**-induced protection is regulated by H-2-linked loci corresponding to two different immune mechanisms. These findings may indicate the need for more than one Ag in a **vaccine** to protect an HLA-diverse population.

L16 ANSWER 145 OF 195 MEDLINE on STN
AN 96196146 MEDLINE
DN 96196146 PubMed ID: 8627050
TI Clinical immunity to **Plasmodium falciparum** malaria is associated with serum antibodies to the 19-kDa C-terminal fragment of the merozoite surface antigen, PfMSP-1.
AU Egan A F; Morris J; Barnish G; Allen S; Greenwood B M; Kaslow D C; Holder A A; Riley E M
CS Institute of Cell, Animal, and Population Biology, Division of Biological Sciences, University of Edinburgh, United Kingdom.
SO JOURNAL OF INFECTIOUS DISEASES, (1996 Mar) 173 (3) 765-9.
Journal code: 0413675. ISSN: 0022-1899.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199606
ED Entered STN: 19960708
Last Updated on STN: 19990129
Entered Medline: 19960626
AB The development of an effective malaria **vaccine** depends upon identification of antigens that are targets of protective immune responses. An immunoepidemiologic approach has been used to investigate

the relationship between antibody responses to a defined region of the major **merozoite surface protein** of **Plasmodium falciparum** (PfMSP-1 19) and resistance to clinical malaria in 2 populations of children from West Africa. After allowing for the confounding effects of age, antibodies to PfMSP-1 19 were shown the provide 40% protection against clinical malaria in children in Sierra Leone. In Gambian children, antibodies to one of the epidermal growth factor-like motifs of PfMSP-1 19 were strongly associated with resistance to both clinical malaria and high levels of parasitemia.

L16 ANSWER 146 OF 195 MEDLINE on STN
AN 97370326 MEDLINE
DN 97370326 PubMed ID: 9226689
TI Identification of **Plasmodium falciparum MSP** -1 peptides able to bind to human red blood cells.
AU Urquiza M; Rodriguez L E; Suarez J E; Guzman F; Ocampo M; Curtidor H; Segura C; Trujillo E; Patarroyo M E
CS Instituto de Inmunologia, Hospital San Juan de Dios, Universidad Nacional de Colombia, Bogota, Colombia.
SO PARASITE IMMUNOLOGY, (1996 Oct) 18 (10) 515-26.
Journal code: 7910948. ISSN: 0141-9838.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199709
ED Entered STN: 19971008
Last Updated on STN: 19990129
Entered Medline: 19970922
AB To determine amino acid sequences of the **Plasmodium falciparum MSP**-1 protein that interact with red blood cell membranes in a specific receptor-ligand interaction, 78 sequential peptides, 20 amino acids long and spanning the entire length of the molecule, were synthesized and analysed with a specific binding assay developed for this purpose. Results show that peptides based on conserved and dimorphic regions of **MSP**-1, interact with human red blood cells (RBCs). This interaction occurs predominantly with peptides contained within the **MSP**-1 proteolytic fragments of 83 kDa, 38 kDa, 33 kDa and 19 kDa. Affinity constants of these peptides were between 140 and 250 nM. Peptide-RBC binding post enzyme treatment showed that the RBC receptors are not sialic acid dependent and appear to be proteic in nature. Some of these peptides inhibited merozoite invasion of RBCs yet did not inhibit intraerthrocytic development. These peptides, in conjunction with those from other **merozoite surface proteins**, may be used to rationally design a second generation of synthetic peptide-based malaria **vaccines**.

L16 ANSWER 147 OF 195 MEDLINE on STN
AN 96110941 MEDLINE
DN 96110941 PubMed ID: 8557348
TI A recombinant baculovirus 42-kilodalton C-terminal fragment of **Plasmodium falciparum merozoite surface protein** 1 protects Aotus monkeys against malaria.
AU Chang S P; Case S E; Gosnell W L; Hashimoto A; Kramer K J; Tam L Q; Hashiro C Q; Nikaido C M; Gibson H L; Lee-Ng C T; Barr P J; Yokota B T; Hut G S
CS Department of Tropical Medicine and Medical Microbiology, John A. Burns School of Medicine, Honolulu, Hawaii 96816, USA.
SO INFECTION AND IMMUNITY, (1996 Jan) 64 (1) 253-61.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)

LA English
FS Priority Journals
EM 199602
ED Entered STN: 19960312
Last Updated on STN: 19990129
Entered Medline: 19960226
AB The immunogenicity and protective efficacy of baculovirus recombinant polypeptide based on the **Plasmodium falciparum merozoite surface protein** 1 (**MSP**-1) has been evaluated in Aotus lemurinus griseimembra monkeys. The **MSP**-1-based polypeptide, BVp42, corresponds to the 42-kDa C-terminal processing fragment of the precursor molecule. Immunization of Aotus monkeys with BVp42 in complete Freund's adjuvant resulted in high antibody titers against the immunogen as well as parasite **MSP**-1. Fine specificity studies indicated that major epitopes recognized by these antibodies localize to conserved determinants of the 19-kDa C-terminal fragment derived from cleavage of the 42-kDa processing fragment. Effective priming of **MSP**-1-specific T cells was also demonstrated in lymphocyte proliferation assays. All three Aotus monkeys immunized with BVp42 in complete Freund's adjuvant showed evidence of protection of protection against blood-stage challenge with P. falciparum. Two animals were completely protected, with only one parasite being detected in thick blood films on a single days after injection. The third animal had a modified course of infection, controlling its parasite infection to levels below detection by thick blood smears for an extended period in comparison with adjuvant control animals. All vaccinated, protected Aotus monkeys produced antibodies which inhibited in vitro parasite growth, indicating that this assay may be a useful correlate of protective immunity and that immunity induced by BVp42 immunization is mediated, at least in part, by a direct effect of antibodies against the **MSP**-1 C-terminal region. The high level of protection obtained in these studies supports further development of BVp42 as a candidate malaria **vaccine**.

L16 ANSWER 148 OF 195 MEDLINE on STN
AN 96418868 MEDLINE
DN 96418868 PubMed ID: 8821653
TI Effect of context and adjuvant on the immunogenicity of recombinant proteins and peptide conjugates derived from the polymorphic malarial surface antigen MSA2.
AU Jones G L; Spencer L; Lord R; Saul A J
CS University of New England, Armidale, NSW, Australia.
SO VACCINE, (1996 Jan) 14 (1) 77-84.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199611
ED Entered STN: 19961219
Last Updated on STN: 20000303
Entered Medline: 19961126
AB We have identified a 51 kDa glycosylated myristylated merozoite surface antigen (MSA2) as the target of a number of monoclonal antibodies which inhibit in vitro invasion of the human malarial parasite **Plasmodium falciparum**. This antigen has been shown to exist in a limited number of strain specific forms but despite wide variation in the sequences of the internal repeat regions both N and C terminal elements of the protein are almost totally conserved. Accordingly, we prepared a large number of overlapping peptide constructs and demonstrated that one peptide SNTFINNA (E71) from the N terminus and two peptides, QHGHMHGS (G5) and NTSDSQKE (G12) from the C terminus could, when suitably conjoined to the carrier protein diphtheria toxoid (DT),

elicit antibodies reactive with MSA2 from diverse strains of P. falciparum. Here we compare the immunogenicity of these peptide constructs with two recombinant proteins containing the entire amino acid sequence of MSA2 from the FCQ-27/PNG strain (1609) and the 3D7 strain (1623). We have formulated these recombinant and peptide antigens with Freund's adjuvant, Alum and Algammulin. Both recombinant and peptide antigens elicit high titre antibodies when tested by ELISA against the immunogens themselves. Although both recombinant proteins include the constant region peptide sequences E71, G5 and G12, the extent of ELISA cross reaction between antibody raised against recombinant and peptide antigen or antibody raised against peptide and recombinant antigen is small and sporadic, and depends to an extent on the adjuvant employed. Antisera against both recombinant proteins 1609 and 1623 detected either recombinant on Western blots, as well as detecting native MSA2 in whole protein extracts from both FCQ-27/PNG and 3D7 strains. Antisera against peptide construct E71 recognized recombinant 1609 but not 1623 but recognized the native MSA2 in both strains studied. Antisera against peptide construct G5 showed a similar pattern of recognition but also detected recombinant 1623 on Western blotting. These results emphasize the importance of context and adjuvant on the ability of selected immunogenic epitopes to elicit antibodies appropriately directed against the native antigen.

L16 ANSWER 149 OF 195 MEDLINE on STN
AN 97224681 MEDLINE
DN 97224681 PubMed ID: 9071065
TI The **merozoite surface protein** 2 (MSP2) gene of **Plasmodium falciparum** from a Thai isolate.
AU Jongwutiwes S; Putaporntip C
CS Department of Parasitology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand.
SO JOURNAL OF THE MEDICAL ASSOCIATION OF THAILAND, (1996 Dec) 79 Suppl 1 S33-9.
Journal code: 7507216. ISSN: 0125-2208.
CY Thailand
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199704
ED Entered STN: 19970422
Last Updated on STN: 20000303
Entered Medline: 19970409
AB The **merozoite surface protein** 2 (MSP2) of **Plasmodium falciparum** was a malaria **vaccine** candidate. The gene encoding MSP2 of a Thai isolate was amplified by polymerase chain reaction followed by subcloning into a phagemid vector and sequencing. Sequence alignment with other previously published sequences revealed that the MSP2 allele in this isolate belonged to FC27 allelic family. The central variable sequence of the MSP2 allele in this study was related to an allele from Indonesia. The flanking sequences of the variable region were highly conserved.

L16 ANSWER 150 OF 195 MEDLINE on STN
AN 95270997 MEDLINE
DN 95270997 PubMed ID: 7538540
TI Identification of T and B cell epitopes recognized by humans in the C-terminal 42-kDa domain of the **Plasmodium falciparum merozoite surface protein** (**MSP**)-1.
AU Udhayakumar V; Anyona D; Kariuki S; Shi Y P; Bloland P B; Branch O H; Weiss W; Nahlen B L; Kaslow D C; Lal A A
CS Immunology Branch, Centers for Disease Control and Prevention, Atlanta, GA 30341, USA.
SO JOURNAL OF IMMUNOLOGY, (1995 Jun 1) 154 (11) 6022-30.

Journal code: 2985117R. ISSN: 0022-1767.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199506
ED Entered STN: 19950629
Last Updated on STN: 19990129
Entered Medline: 19950622
AB The 42-kDa, C-terminal region of the **merozoite surface protein**-1 (**MSP**-1) of **Plasmodium falciparum** is a putative malaria **vaccine** candidate Ag. Nine synthetic peptides corresponding to predicted T cell sites of **MSP**-1 in blocks 15 and 16 and eight overlapping peptides representing the conserved block 17 were used to identify naturally immunogenic epitopes. These peptides were tested for their ability to induce proliferation of PBMC from residents in western Kenya, where malaria transmission is holoendemic. Six peptides (PL145, PL146, PL147, PL148, PL149, and PL150) from blocks 15 and 16 induced a positive proliferative response in > 30% of the individuals tested, and three peptides (PL151, PL152, and PL153) induced a proliferative response in < 25% of the donors. Among these peptides, PL146 was from the highly conserved region, PL150 was from a polymorphic region, and all other peptides were from a dimorphic region of blocks 15 and 16. In block 17, only three peptides, PL99, PL100, and PL103, induced proliferation in 30 to 37% of the volunteers. The rest of the peptides induced a proliferative response in approximately 13 to 25% of the donors. The plasma from these donors widely reacted with different allelic forms of 19-kDa recombinant proteins representing block 17 and recognized at least two linear B epitopes, PL104 and PL97. In summary, this study revealed that a majority of immunodominant T and B epitopes are localized in the conserved or dimorphic regions that are nonpolymorphic in the 42-kDa protein of **MSP**-1. This study suggests that incorporation of T epitopes from the dimorphic blocks 15 and 16 in a **vaccine** construct may be useful to ensure Ag-specific memory responses.

L16 ANSWER 151 OF 195 MEDLINE on STN
AN 96029733 MEDLINE
DN 96029733 PubMed ID: 7591074
TI Human antibody response to **Plasmodium falciparum merozoite surface protein** 2 is serogroup specific and predominantly of the immunoglobulin G3 subclass.
AU Taylor R R; Smith D B; Robinson V J; McBride J S; Riley E M
CS Institute of Cell, Animal and Population Biology, University of Edinburgh, Ashworth Laboratories, Scotland.
SO INFECTION AND IMMUNITY, (1995 Nov) 63 (11) 4382-8.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199511
ED Entered STN: 19960124
Last Updated on STN: 20000303
Entered Medline: 19951130
AB MSP2 is a **merozoite surface protein** of **Plasmodium falciparum** and, as such, is a potential component of a malaria **vaccine**. In this study, we have used a panel of recombinant MSP2 antigens in enzyme-linked immunosorbent assays to investigate the recognition of MSP2 by antibodies from malaria-immune human serum. These recombinant antigens include full-length proteins of serogroups A and B and fragments representing the conserved, group-specific, or repeat regions of each serogroup. Ninety-five percent

of the serum samples tested contained MSP2-specific antibodies: 81% of serum samples tested responded to serogroup A, and 86% responded to serogroup B. The antibody response is directed almost exclusively towards dimorphic and polymorphic regions of MSP2; the conserved regions are rarely recognized, and antibodies to serogroups A and B do not cross-react. Interestingly, the antibody response is predominately of the cytophilic and complement-fixing subclass immunoglobulin G3.

L16 ANSWER 152 OF 195 MEDLINE on STN
AN 96009999 MEDLINE
DN 96009999 PubMed ID: 7569897
TI Mating patterns in malaria parasite populations of Papua New Guinea.
CM Comment in: Science. 1995 Sep 22;269(5231):1670
Comment in: Science. 1996 Mar 1;271(5253):1300-1
AU Paul R E; Packer M J; Walmsley M; Lagog M; Ranford-Cartwright L C; Paru R; Day K P
CS Department of Zoology, University of Oxford, UK.
SO SCIENCE, (1995 Sep 22) 269 (5231) 1709-11.
Journal code: 0404511. ISSN: 0036-8075.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199510
ED Entered STN: 19951227
Last Updated on STN: 19990129
Entered Medline: 19951025
AB Description of the genetic structure of malaria parasite populations is central to an understanding of the spread of multiple-locus drug and **vaccine** resistance. The **Plasmodium falciparum** mating patterns from madang, Papua New Guinea, where intense transmission of malaria occurs, are described here. A high degree of inbreeding occurs in the absence of detectable linkage disequilibrium. This contrasts with other studies, indicating that the genetic structure of malaria parasite populations is neither clonal nor panmictic but will vary according to the transmission characteristics of the region.

L16 ANSWER 153 OF 195 MEDLINE on STN
AN 96143617 MEDLINE
DN 96143617 PubMed ID: 8552419
TI Assessment of the role of the humoral response to **Plasmodium falciparum** MSP2 compared to RESA and SPf66 in protecting Papua New Guinean children from clinical malaria.
AU al-Yaman F; Genton B; Anders R; Taraika J; Ginny M; Mellor S; Alpers M P
CS Papua New Guinea Institute of Medical Research, Madang, Papua New Guinea.
SO PARASITE IMMUNOLOGY, (1995 Sep) 17 (9) 493-501.
Journal code: 7910948. ISSN: 0141-9838.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199602
ED Entered STN: 19960306
Last Updated on STN: 20000303
Entered Medline: 19960220
AB The prevalence and concentration of naturally acquired humoral response (IgG) to **merozoite surface protein** 2 (MSP2), RESA, SPf66 and crude schizont extract were measured in a population living in a malaria highly endemic area of Papua New Guinea. A prospective longitudinal study in 0.5-15 year old children was conducted for one year in order to examine the relationship between the humoral response to these antigens and subsequent susceptibility to clinical malaria using a series of clinical definitions. The prevalence and

concentration of antibodies to all antigens increased with age. Such correlation with age was most marked for MSP2 recombinant proteins. When age and previous exposure were controlled for, only antibody levels to MSP2 recombinant proteins (3D7 and d3D7) and to RESA predicted a reduction in incidence rate of episodes of clinical malaria. Our results support the inclusion of the recombinant proteins of the 3D7 allelic family of merozoite surface antigen 2 and RESA into a subunit **vaccine** against malaria.

L16 ANSWER 154 OF 195 MEDLINE on STN
AN 95122174 MEDLINE
DN 95122174 PubMed ID: 7822010
TI Serum antibodies from malaria-exposed people recognize conserved epitopes formed by the two epidermal growth factor motifs of MSP1(19), the carboxy-terminal fragment of the major **merozoite surface protein** of **Plasmodium falciparum**.
AU Egan A F; Chappel J A; Burghaus P A; Morris J S; McBride J S; Holder A A; Kaslow D C; Riley E M
CS Institute of Cell, Animal and Population Biology, University of Edinburgh, United Kingdom.
SO INFECTION AND IMMUNITY, (1995 Feb) 63 (2) 456-66.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199502
ED Entered STN: 19950223
Last Updated on STN: 19990129
Entered Medline: 19950216
AB The major **merozoite surface protein** of **Plasmodium falciparum** (PfMSP1) is a candidate antigen for a malaria **vaccine**. A 19-kDa C-terminal processing product of PfMSP1 (PfMSP1(19)) is composed of two domains sharing a cysteine-rich motif with epidermal growth factor (EGF) and is the target of monoclonal antibodies which block erythrocyte invasion in vitro. We have evaluated human antibody responses to PfMSP1(19) by using recombinant proteins representing the EGF motifs encoded by the two main alleles of the MSP1 gene. We find that both EGF motifs are antigenic but that only 10 to 20% of malaria-exposed individuals have serum antibodies that recognized either of the motifs. When both EGF motifs were expressed together as a single protein, they were recognized by more than 40% of sera from malaria-exposed individuals. Major epitopes recognized by human antibodies are dependent upon the correct tertiary structure of the protein and are cross-reactive between the different allelic sequences of PfMSP1(19). This suggests that antibodies induced by vaccination with one or the other allelic forms of the protein could recognize all strains of P. falciparum. Immunoglobulin G (IgG) subclass-specific enzyme immunoassays indicate that PfMSP1(19) antibodies are predominantly of the IgG1 subclass.

L16 ANSWER 155 OF 195 MEDLINE on STN
AN 96074153 MEDLINE
DN 96074153 PubMed ID: 7485698
TI Safety, immunogenicity, and pilot efficacy of **Plasmodium falciparum** sporozoite and asexual blood-stage combination **vaccine** in Swiss adults.
AU Sturchler D; Berger R; Rudin C; Just M; Saul A; Rzepczyk C; Brown G; Anders R; Coppel R; Woodrow G; +
CS Tropical Medicine Unit, F. Hoffmann-La Roche & Co., Ltd., Basel, Switzerland.
SO AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE, (1995 Oct) 53 (4) 423-31.

Journal code: 0370507. ISSN: 0002-9637.
CY United States
DT (CLINICAL TRIAL)
(CLINICAL TRIAL, PHASE I)
Journal; Article; (JOURNAL ARTICLE)
(RANDOMIZED CONTROLLED TRIAL)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199512
ED Entered STN: 19960124
Last Updated on STN: 19990129
Entered Medline: 19951213
AB This study was part of a larger program to develop a **vaccine** effective against **Plasmodium falciparum** infection caused by sporozoites and clinical malaria caused by asexual blood stages. In a phase 1 study of safety and immunogenicity, two recombinant proteins (Ro 46-2717, a circumsporozoite [CS] protein) construct with a molecular mass of 35 kD, and Ro 46-2924, a merozoite surface antigen [MSA-2] construct with a molecular mass of 25 kD) adsorbed onto alum were injected in two low (20 micrograms) or two high (100 micrograms) doses in the right and left deltoid muscles of 33 healthy Swiss volunteers; six other volunteers received a placebo (alum alone). Twenty-six participants reported 51 immunization-related adverse events, mainly pain at the injection site. Mean antibody titers to CS protein and MSA-2 in an indirect immunofluorescence assay peaked four weeks after the second immunization without evidence of boosting (i.e., sharp increase in titer). By that time, 56% and 31% of the vaccinees seroconverted to CS protein and MSA-2, respectively, with the increase in MSA-2 titer being weaker than that for the CS protein. After a third immunization, five vaccinees volunteered to be challenged by three or four infective bites of Anopheles stephensi. Prepatent and incubation periods in all five were comparable with unvaccinated historic controls challenged under similar conditions, and all had symptoms of clinical falciparum malaria. We conclude that the **vaccine** components were safe and immunogenic but there was no evidence that this immunization regimen with the CS protein plus MSA-2 component was able to prevent infection.(ABSTRACT TRUNCATED AT 250 WORDS)

L16 ANSWER 156 OF 195 MEDLINE on STN
AN 96091356 MEDLINE
DN 96091356 PubMed ID: 8529111
TI Immunogenicity and in vivo efficacy of recombinant **Plasmodium falciparum merozoite surface protein** -1 in Aotus monkeys.
AU Kumar S; Yadava A; Keister D B; Tian J H; Ohl M; Perdue-Greenfield K A; Miller L H; Kaslow D C
CS Laboratory of Malaria Research, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland 20892, USA.
SO MOLECULAR MEDICINE, (1995 Mar) 1 (3) 325-32.
Journal code: 9501023. ISSN: 1076-1551.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199601
ED Entered STN: 19960220
Last Updated on STN: 19990129
Entered Medline: 19960129
AB BACKGROUND: The carboxy-terminus of the **merozoite surface protein**-1 (MSP1) of **Plasmodium falciparum** has been implicated as a target of protective immunity. MATERIALS AND METHODS: Two recombinant proteins from the carboxy-terminus of MSP1, the 42 kD fused to GST (bMSP1(42)) and the 19 kD (yMSP1(19)),

were expressed in Escherichia coli and secreted from Saccharomyces cerevisiae, respectively. To determine if vaccination with these recombinant proteins induces protective immunity, we conducted a randomized, blinded **vaccine** trial in two species of Aotus monkeys, A. nancymai and A. vociferans. After three injections using Freund's adjuvant, the monkeys were challenged with the virulent Vietnam Oak Knoll (FVO) strain of P. falciparum. RESULTS: All three control monkeys required treatment by Day 19. Two of three monkeys vaccinated with bMSP1(42) required treatment by Day 17, whereas the third monkey controlled parasitemia for 28 days before requiring treatment. In contrast, both of the A. nancymai vaccinated with yMSP1(19) self-resolved an otherwise lethal infection. One of the two yMSP1(19)-vaccinated A. vociferans had a prolonged prepatent period of > 28 days before requiring treatment. No evidence of mutations were evident in the parasites recovered after the prolonged prepatent period. Sera from the two A. nancymai that self-cured had no detectable effect on in vitro invasion. CONCLUSIONS: Vaccination of A. nancymai with yMSP1(19) induced protective immune responses. The course of recrudescing parasitemias in protected monkeys suggested that immunity is not mediated by antibodies that block invasion. Our data indicate that **vaccine** trials with the highly adapted FVO strain of P. falciparum can be tested in A. nancymai and that MSP1(19) is a promising anti-blood-stage **vaccine** for human trials.

L16 ANSWER 157 OF 195 MEDLINE on STN
AN 96123395 MEDLINE
DN 96123395 PubMed ID: 8577332
TI A direct and rapid sequencing strategy for the **Plasmodium falciparum** antigen gene gp190/MSA1.
AU Pan W; Tolle R; Bujard H
CS Zentrum fur Molekulare Biologie der Universitat Heidelberg (ZMBH), Germany.
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (1995 Jul) 73 (1-2) 241-4. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-X03371; GENBANK-Z35327
EM 199603
ED Entered STN: 19960321
Last Updated on STN: 19990129
Entered Medline: 19960308

L16 ANSWER 158 OF 195 MEDLINE on STN
AN 95153897 MEDLINE
DN 95153897 PubMed ID: 7851007
TI Antibody and clinical responses in volunteers to immunization with malaria peptide-diptheria toxoid conjugates.
AU Ramasamy R; Wijesundere D A; Nagendran K; Ramasamy M S
CS Division of Life Sciences, Institute of Fundamental Studies, Kandy, Sri Lanka.
SO CLINICAL AND EXPERIMENTAL IMMUNOLOGY, (1995 Feb) 99 (2) 168-74. Journal code: 0057202. ISSN: 0009-9104.
CY ENGLAND: United Kingdom
DT (CLINICAL TRIAL)
Journal; Article; (JOURNAL ARTICLE)
(RANDOMIZED CONTROLLED TRIAL)
LA English
FS Priority Journals
EM 199503
ED Entered STN: 19950322
Last Updated on STN: 20000303

Entered Medline: 19950316

AB Twenty residue peptides from the 185-200-kD and 45-kD merozoite surface antigens of the malaria parasite **Plasmodium falciparum** were covalently linked to diphtheria toxoid as a carrier and used to immunize human volunteers with aluminium hydroxide as an adjuvant. Significant antibody levels were elicited by two boosting injections. The antibodies reacted with acetone-methanol fixed merozoite membranes in an immunofluorescence assay, but no inhibition of merozoite reinvasion could be detected in in vitro cultures containing the antibodies. Antibody levels against the immunizing peptides declined markedly within 77 days after the third injection. No hypersensitivity was observed against the peptides. However, the volunteers developed hypersensitivity against diphteria toxoid, and in particular a pronounced type III (Arthus) hypersensitivity after three injections with the toxoid. This effect might appear to limit the use of peptide-diphtheria toxoid conjugates for human immunization. Several biochemical, haematological and immunological tests done on the volunteers showed no other adverse effects from the immunizations.

L16 ANSWER 159 OF 195 MEDLINE on STN
AN 96123382 MEDLINE
DN 96123382 PubMed ID: 8577318
TI Sequence heterogeneity of the C-terminal, Cys-rich region of the **merozoite surface protein**-1 (**MSP**-1) in field samples of **Plasmodium falciparum**.
AU Kang Y; Long C A
CS Department of Microbiology and Immunology, Medical College of Pennsylvania, Philadelphia, USA.
NC AI-21089 (NIAID)
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (1995 Jul) 73 (1-2) 103-10. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199603
ED Entered STN: 19960321
Last Updated on STN: 20000303
Entered Medline: 19960308

AB Recent results with primate plasmodia and rodent models of infection have focused attention on the C-terminal region of the **merozoite surface protein**-1 (**MSP**-1) as one of the leading candidates for vaccination against the erythrocytic stages of malaria. However, sequence heterogeneity of this region may compromise its use as a **vaccine** candidate. While the C-terminal region of **MSP**-1 from the two prototypic alleles of P. falciparum has been shown to be relatively conserved in laboratory-maintained strains, little data exist on sequence heterogeneity of this region in field isolates from diverse geographic areas. To address this question, DNA encoding the C-terminal, Cys-rich region of P. falciparum **MSP**-1 from field samples was analyzed by a polymerase chain reaction (PCR)-direct sequencing method. Sequence data were consistent with those obtained from laboratory-maintained strains. In 15 isolates from Africa, Asia and Latin America, only a few nucleotide changes were found leading to amino-acid alterations at four positions out of 102 residues. All the variations corresponded to the predicted amino-acid sequence of the other prototype, suggesting that these changes were possibly due to allelic recombinations. The four changes were E-->Q at position 1644 and TSR-->KNG, or KNG-->TSR at positions 1691, 1700 and 1701. Thus, only three patterns of the C-terminal, Cys-rich region of **MSP**-1, E-TSR, Q-KNG and Q-TSR, were detected. All the Cys residues were conserved. These results support the potential utility of the C-terminal region of **MSP**-1 as a **vaccine** candidate.

L16 ANSWER 160 OF 195 MEDLINE on STN
AN 95354799 MEDLINE
DN 95354799 PubMed ID: 7628572
TI **Plasmodium falciparum**: malaria morbidity is associated with specific merozoite surface antigen 2 genotypes.
AU Engelbrecht F; Felger I; Genton B; Alpers M; Beck H P
CS Papua New Guinea Institute of Medical Research, Madang.
SO EXPERIMENTAL PARASITOLOGY, (1995 Aug) 81 (1) 90-6.
Journal code: 0370713. ISSN: 0014-4894.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
(MULTICENTER STUDY)
LA English
FS Priority Journals
EM 199509
ED Entered STN: 19950921
Last Updated on STN: 20000303
Entered Medline: 19950905
AB **Plasmodium falciparum** merozoite surface antigen 2 (MSA2) is considered a **vaccine** candidate in a subunit **vaccine** against blood stage malaria. In order to test if a specific genotype of the highly polymorphic MSA2 is associated with disease, we conducted a case-control study in a malaria endemic area of Papua New Guinea involving 227 individuals, mostly children under the age of 10 years. All cases and controls were genotyped by polymerase chain reaction for their respective MSA2 genotypes. We report that at the time of the study parasites carrying the FC27-like genotype were twice as likely to be found in symptomatic malaria cases than in asymptomatic controls. Mixed genotype infections were significantly less frequent in symptomatic malaria infections. One individual allele (WOS10) of the FC27 family was found only in cases. This may be a form of P. falciparum infrequently encountered and may cause morbidity due to lack of immunity to it. This study provides evidence that MSA2 is involved in the morbidity of malaria and supports the inclusion of MSA2 in a subunit **vaccine**.

L16 ANSWER 161 OF 195 MEDLINE on STN
AN 95012640 MEDLINE
DN 95012640 PubMed ID: 7927713
TI Naturally acquired human antibodies which recognize the first epidermal growth factor-like module in the **Plasmodium falciparum merozoite surface protein** 1 do not inhibit parasite growth in vitro.
AU Chappel J A; Egan A F; Riley E M; Druilhe P; Holder A A
CS Division of Parasitology, National Institute for Medical Research, London, United Kingdom.
SO INFECTION AND IMMUNITY, (1994 Oct) 62 (10) 4488-94.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199411
ED Entered STN: 19941222
Last Updated on STN: 20000303
Entered Medline: 19941104
AB **Merozoite surface protein** 1, one of the major surface proteins of the invasive blood stage of the malaria parasite, is a prime candidate for the development of a **vaccine** against the human disease. Previously, monoclonal antibodies which both inhibited the growth of **Plasmodium falciparum** in vitro and bound to the first of two epidermal growth factor-like modules located

near the carboxy terminus of the protein had been identified. In this study, we have used affinity chromatography on a recombinant fusion protein corresponding to the first epidermal growth factor-like module in P. falciparum **merozoite surface protein** 1 to prepare antibody induced by natural infection. The antibody was purified from the total immunoglobulin G fraction of adult West African donors, shown to passively confer immunity against falciparum malaria. Such affinity-purified antibodies were shown to recognize the native protein by a number of separate criteria and to block the binding of an inhibitory monoclonal antibody, but they failed to inhibit parasite invasion in an in vitro growth assay. These results indicate that antibody alone is not sufficient to interfere with erythrocyte invasion.

L16 ANSWER 162 OF 195 MEDLINE on STN
AN 94194108 MEDLINE
DN 94194108 PubMed ID: 8144929
TI Regulation of antibody specificity to **Plasmodium falciparum merozoite surface protein** -1 by adjuvant and MHC haplotype.
AU Chang S P; Nikaido C M; Hashimoto A C; Hashiro C Q; Yokota B T; Hui G S
CS Department of Tropical Medicine & Medical Microbiology, John A. Burns School of Medicine, University of Hawaii, Honolulu 96816.
NC AI-27130 (NIAID)
AI-30589 (NIAID)
SO JOURNAL OF IMMUNOLOGY, (1994 Apr 1) 152 (7) 3483-90.
Journal code: 2985117R. ISSN: 0022-1767.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199404
ED Entered STN: 19940511
Last Updated on STN: 19990129
Entered Medline: 19940429
AB An effective malaria **vaccine** must be capable of eliciting a protective immune response in individuals of diverse genetic makeup. In this report, we describe the co-regulation of immune responsiveness to growth-inhibitory **Plasmodium falciparum merozoite surface protein**-1 (**MSP**-1) epitopes by MHC-linked immune response genes and by the adjuvant used in **MSP**-1 **vaccine** formulations. When congenic mice differing in MHC haplotype were immunized with **MSP**-1 either in CFA or incorporated into a synthetic monophosphoryl lipid A (LA-15-PH)-liposome formulation, mice of different haplotypes produced anti-**MSP**-1 Abs capable of inhibiting P. falciparum growth. Mice of H-2b and H-2ja haplotypes produced Abs possessing high levels of inhibitory activity upon immunization with **MSP**-1 in LA-15-PH/liposomes whereas these haplotypes produced noninhibitory Abs when immunized with **MSP**-1 in CFA. Conversely, H-2d haplotype mice produced inhibitory Abs when immunized with **MSP**-1 in CFA but not when immunized with **MSP**-1 in LA-15-PH/liposomes. The LA-15-PH/liposome adjuvant was more effective than CFA in inducing growth-inhibitory Abs. The level of parasite growth inhibition observed for a particular mouse strain correlated with Ab titers against conserved, C-terminal **MSP**-1 epitopes, which appear to be important targets for Ab-mediated inhibition in mice immunized with both adjuvant formulations. Our results suggest that adjuvant formulation and MHC genes act in a reciprocal manner to control immune responsiveness to specific epitopes, and raise the possibility of manipulating genetically-controlled responsiveness to **vaccine** Ags by utilizing alternative adjuvants in **vaccine** formulations.

L16 ANSWER 163 OF 195 MEDLINE on STN

AN 94327942 MEDLINE
DN 94327942 PubMed ID: 8051413
TI Analysis of human T cell clones specific for conserved peptide sequences within malaria proteins. Paucity of clones responsive to intact parasites.
AU Quakyi I A; Currier J; Fell A; Taylor D W; Roberts T; Houghten R A; England R D; Berzofsky J A; Miller L H; Good M F
CS Malaria and Arbovirus Unit, Queensland Institute of Medical Research, Brisbane, Australia.
SO JOURNAL OF IMMUNOLOGY, (1994 Sep 1) 153 (5) 2082-92.
Journal code: 2985117R. ISSN: 0022-1767.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199409
ED Entered STN: 19940914
Last Updated on STN: 19940914
Entered Medline: 19940906
AB T cells are thought to be of central importance in malaria immunity. Peptides copying malaria protein sequences often stimulate human CD4+ T cells and it was thought that they represented T cell epitopes present in the parasite and may thus have particular relevance to malaria **vaccine** development. To verify whether synthetic peptides representing highly conserved regions of parasite Ags may contribute to a malaria **vaccine**, we searched the data bank for conserved regions of **Plasmodium falciparum** malaria proteins that were not homologous to known self (human) proteins. We synthesized 24 such peptides representing 11 of the cloned and sequenced malaria asexual stage Ags, which were predicted by algorithms to represent T cell epitopes, and 6 peptides not predicted to be T cell epitopes and used these to generate T cell clones from individuals with an extensive previous history of malaria exposure. The T cell clones responded vigorously to many peptides but only a single clone, specific for a peptide within **merozoite surface protein**-1, 20-39, VTHESYQELVKKLEALEDAV, and not previously defined to be a T cell epitope responded to malaria parasites by proliferation and secretion of IFN-gamma. This epitope was not revealed by studying parasite-induced T cell lines and is thus subdominant. The clone was able to significantly inhibit parasite growth in vitro. The final step in the inhibition of parasite growth appears to be nonspecific because other activated clones (not specific for malaria sequences) can inhibit parasite growth. Our data suggest that few conserved peptides within malaria parasites can be processed from the intact parasite. However, such peptides that can be processed from malaria parasites may be expected to stimulate parasite-specific T cells that could inhibit parasite growth and as such may be lead candidates for a **vaccine** aimed at inducing cellular immunity to malaria.

L16 ANSWER 164 OF 195 MEDLINE on STN
AN 94300081 MEDLINE
DN 94300081 PubMed ID: 8027549
TI Induction of antibodies to the **Plasmodium falciparum merozoite surface protein**-1 (MSP1) by cross-priming with heterologous MSP1s.
AU Hui G S; Hashimoto A C; Nikaido C M; Choi J; Chang S P
CS Department of Tropical Medicine, University of Hawaii, Honolulu 96816.
NC AI27130 (NIAID)
AI30589 (NIAID)
SO JOURNAL OF IMMUNOLOGY, (1994 Aug 1) 153 (3) 1195-201.
Journal code: 2985117R. ISSN: 0022-1767.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals

EM 199408
ED Entered STN: 19940818
Last Updated on STN: 19990129
Entered Medline: 19940809
AB The **merozoite surface protein**-1 (MSP1) of **Plasmodium falciparum** possesses intervening conserved and nonconserved sequences. The relative importance of these sequences in providing T cell help for Ab production was investigated in a series of cross-priming studies using homologous and heterologous parasite MSP1 proteins. Cross-priming with heterologous MSP1s was as efficient as homologous immunizations in inducing anti-MSP1 Abs. Similar to homologous immunization, cross-priming with heterologous MSP1s induced primarily Abs to conserved epitopes. The specificities of the Abs were also similar for the two immunization regimens. Studies were also performed with use of the C-terminal p42 fragment of MSP1 expressed in baculovirus (BVp42). When BVp42 was used either as the priming Ag followed by boosting with homologous (or heterologous) MSP1 or as the booster Ag after priming with homologous (or heterologous) MSP1, much lower anti-BVp42 Ab titers were produced compared with priming/boosting with homologous or heterologous MSP1s or BVp42 alone. Thus, immunization with the complete parasite MSP1 induced a dominant, conserved Th epitope(s) specific for anti-p42 Ab production, and such determinant(s) was either located outside the p42 region or was not provided by the BVp42 because of possible differences in the processing of parasite MSP1 vs BVp42. Our data provided a strong rationale to identify and include conserved Th epitope(s) in MSP1 **vaccines**. Furthermore, a MSP1 **vaccine** on the basis of the C-terminal p42 fragment may benefit by the inclusion of additional Th epitopes to achieve effective boosting in the field.

L16 ANSWER 165 OF 195 MEDLINE on STN
AN 95066340 MEDLINE
DN 95066340 PubMed ID: 7526572
TI Construction of a synthetic immunogen: use of the natural immunomodulator polytuftsin in malaria **vaccines** against RESA antigen of **Plasmodium falciparum**.
AU Pawan K; Ivanov B B; Kabilan L; Rao D N
CS Department of Biochemistry, All India Institute of Medical Sciences, New Delhi.
SO VACCINE, (1994 Jul) 12 (9) 819-24.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199412
ED Entered STN: 19950110
Last Updated on STN: 19990129
Entered Medline: 19941228
AB Polytuftsin, a 35-40-unit repeat of the naturally occurring tetrapeptide tuftsin (TKPR), was chemically linked to EENVEHDA and DDEHVEEPTVA repeat sequences of ring-infected erythrocyte surface antigen protein (an asexual blood-stage antigen) of **Plasmodium falciparum**. These synthetic constructs were tested for their humoral and cellular immune responses in five inbred strains of mice with different genetic backgrounds (H-2a, H-2b, H-2d, H-2k and H-2i). Mice immunized with these constructs showed higher antibody titres, secondary immune responses and antigen-induced T-cell proliferation compared with the peptide dimers alone. Sera from mice immunized with both the constructs inhibited merozoite invasion of erythrocytes in vitro by 60-80% at 1:10 antisera dilution. Polytuftsin alone proved to be a very poor immunogen in our studies, since no anti-tuftsin antibodies could be detected in the sera. Therefore, we conclude that the synthetic constructs described here could be useful for the development of subunit malaria **vaccines**.

L16 ANSWER 166 OF 195 MEDLINE on STN
AN 94131607 MEDLINE
DN 94131607 PubMed ID: 8300225
TI Cellular and humoral immune responses to well-defined blood stage antigens (major merozoite surface antigen) of **Plasmodium falciparum** in adults from an Indian zone where malaria is endemic.
AU Kabilan L; Sharma V P; Kaur P; Ghosh S K; Yadav R S; Chauhan V S
CS Malaria Research Center, Delhi, India.
SO INFECTION AND IMMUNITY, (1994 Feb) 62 (2) 685-91.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199403
ED Entered STN: 19940318
Last Updated on STN: 19990129
Entered Medline: 19940304
AB Conserved and variant regions of two blood stage **vaccine** candidate antigens of **Plasmodium falciparum**, merozoite surface antigen (MSA-1) and ring-infected erythrocyte surface antigen (Pf155/RESA), have been shown to be immunogenic. However, the relative immunogenicity of these immunogens in different populations has not been studied. The conserved N-terminal region of MSA-1 was investigated for its immunogenicity by studying cellular (T cell) and humoral (B cell) immune responses in P. falciparum-primed individuals, living in malaria-hyperendemic areas (Orissa State, India), where malaria presents an alarming situation. MSA-1-derived synthetic peptides contained sequences that activated T cells to proliferate and release gamma interferon in vitro. There was considerable variation in the responses to different peptides. However, the highest responses (51% [18 of 35] by proliferation and 34% [12 of 35] by gamma interferon release) were obtained with a synthetic hybrid peptide containing sequences from conserved N- and C-terminal repeat regions of MSA-1 and Pf155/RESA, respectively. Antibody reactivities in an enzyme immunoassay of plasma samples from these donors to different peptides used for T-cell activation were heterogeneous. In general, there was poor correlation between DNA synthesis and either gamma interferon release or antibody responses in individual donors, underlining the importance of examining several parameters of T-cell activation to assess the total T-cell responsiveness of a study population to a given antigen. However, the results from our studies suggest that synthetic constructs containing sequences from the N- and C-terminal regions of MSA-1 and Pf155/RESA representing different erythrocytic stages of the P. falciparum parasite are more immunogenic in humans living in malaria-hyperendemic areas of India who have been primed by natural infection.

L16 ANSWER 167 OF 195 MEDLINE on STN
AN 94321095 MEDLINE
DN 94321095 PubMed ID: 8045680
TI A novel strategy for the synthesis of the cysteine-rich protective antigen of the malaria **merozoite surface protein** (**MSP**-1). Knowledge-based strategy for disulfide formation.
AU Spetzler J C; Rao C; Tam J P
CS Department of Microbiology and Immunology, Vanderbilt University Medical Center, Nashville, Tennessee.
NC AI 28701 (NIAID)
CA 36544 (NCI)
SO INTERNATIONAL JOURNAL OF PEPTIDE AND PROTEIN RESEARCH, (1994 Apr) 43 (4) 351-8.
Journal code: 0330420. ISSN: 0367-8377.
CY Denmark

DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199408
ED Entered STN: 19940909
Last Updated on STN: 20000303
Entered Medline: 19940830
AB The most promising antigen for a protective malaria **vaccine** is a cysteine-rich domain at the carboxyl terminus of the **merozoite surface protein** (**MSP**-1). Passive transfer of anti-**MSP**-1 antibody or immunization of **MSP**-1 against infection challenge confers protection in primate and rodent models. The antigen belongs to the three-disulfide epidermal growth factor (EGF) family based on the alignment of the six cysteines. In the K1 strain there are, however, only four cysteines corresponding to the four carboxyl cysteines of EGF. Furthermore, disulfide pairing would produce a non-EGF pattern. Because this cysteine-rich antigen is conformation-dependent, and reduction of the disulfide bonds abolishes antigenicity, we used a synthetic analog to investigate the probable disulfide pairing of this antigen. This paper describes the synthesis, folding and disulfide pairings of two 50-residue cysteine-rich peptides. One contains two disulfides (VK-50) derived from the native sequence of **MSP**-1 of the Thailand K1 strain (aa 1629-1679). The other contains an EGF-like, three-disulfide [Cys-9,14]VK-50 peptide. Both peptides were synthesized by a solid-phase method using Fmoc-chemistry. The crude peptide of VK-50 was folded, and the disulfide was oxidized by the DMSO method to obtain a structure with an expected disulfide pairing of 3-4, and 5-6. The specific pairing pattern of 1-3, 2-4 and 5-6 in [Cys 9,14]VK-50 corresponding to EGF in [Cys 9,14]VK-50 was obtained using a 'knowledge-based' (KB) strategy for their formation.(ABSTRACT TRUNCATED AT 250 WORDS)

L16 ANSWER 168 OF 195 MEDLINE on STN
AN 94277152 MEDLINE
DN 94277152 PubMed ID: 7516493
TI Expression and antigenicity of **Plasmodium falciparum** major **merozoite surface protein** (MSP1(19)) variants secreted from Saccharomyces cerevisiae.
AU Kaslow D C; Hui G; Kumar S
CS Molecular Vaccine Section, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD 20892.
NC AI30589 (NIAID)
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (1994 Feb) 63 (2) 283-9.
Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199407
ED Entered STN: 19940729
Last Updated on STN: 20000303
Entered Medline: 19940721
AB Four antigenic variants of the 19-kDa carboxy terminal fragment of **Plasmodium falciparum merozoite surface protein**, MSP1 (MSP1(19)), were expressed in Saccharomyces cerevisiae as a histidine-tagged, secreted polypeptides (rMSP1(19)s). Structural analysis of the rMSP1(19)s indicated that a single amino acid change (E to Q) in the first EGF-like domain of the yeast-secreted rMSP1(19) proteins caused a significant change in their disulfide bond-dependent conformation. The antigenicity of the rMSP1(19)s were qualitatively and quantitatively analyzed by direct and competitive binding ELISAs. The data indicate that conserved and variant B cell determinants of MSP1(19), as well as epitopes that are known targets of

protective antibodies, were recreated authentically in the rMSP1(19)s. Secretion of histidine-tagged rMSP1(19)s using the expression system described may be an efficient and effective means of producing a properly folded immunogen for a human **vaccine** against the blood stages of P. falciparum.

L16 ANSWER 169 OF 195 MEDLINE on STN
AN 96002389 MEDLINE
DN 96002389 PubMed ID: 7565137
TI A novel merozoite surface antigen of **Plasmodium falciparum** (**MSP**-3) identified by cellular-antibody cooperative mechanism antigenicity and biological activity of antibodies.
AU Oeuvray C; Bouharoun-Tayoun H; Grass-Masse H; Lepers J P; Ralamboranto L; Tartar A; Druilhe P
CS Laboratoire de Parasitologie Medicale, Institut Pasteur, Paris, France.
SO MEMORIAS DO INSTITUTO OSWALDO CRUZ, (1994) 89 Suppl 2 77-80.
Journal code: 7502619. ISSN: 0074-0276.
CY Brazil
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199510
ED Entered STN: 19951227
Last Updated on STN: 20000303
Entered Medline: 19951020
AB We report the identification of a 48kDa antigen targeted by antibodies which inhibit **Plasmodium falciparum** in vitro growth by cooperation with blood monocytes in an ADCI assay correlated to the naturally acquired protection. This protein is located on the surface of the merozoite stage of P. falciparum, and is detectable in all isolates tested. Epidemiological studies demonstrated that peptides derived from the amino acid sequence of **MSP**-3 contain potent B and T-cell epitopes recognized by a majority of individuals living in endemic areas. Moreover human antibodies either purified on the recombinant protein, or on the synthetic peptide **MSP**-3b, as well as antibodies raised in mice, were all found to promote parasite killing mediated by monocytes.

L16 ANSWER 170 OF 195 MEDLINE on STN
AN 94136016 MEDLINE
DN 94136016 PubMed ID: 8303942
TI Expression of the **merozoite surface protein** gp195 in vaccinia virus.
AU Sandhu J S; Kennedy J F
CS Wellcome Research Laboratories, Beckenham, Kent, UK.
SO VACCINE, (1994 Jan) 12 (1) 56-64.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199403
ED Entered STN: 19940318
Last Updated on STN: 19940318
Entered Medline: 19940310
AB The DNA sequence coding for the merozoite protein gp195 was inserted into the vaccinia virus expression plasmid pvHAX31. This recombinant plasmid was used to integrate the gp195 DNA into the vaccinia virus genome by homologous recombination. The resulting chimeric virus was tested for gp195 expression in CV-1 cells by Western blotting. The virus that gave positive results was then grown on a large scale and used to infect rabbits. The animal antibody response towards gp195 was analysed in detail. The possibility of using gp195 as a component in a multivalent malaria **vaccine** is discussed.

L16 ANSWER 171 OF 195 MEDLINE on STN
AN 95002199 MEDLINE
DN 95002199 PubMed ID: 7918680
TI Cycle DNA sequencing with [alpha-35S]dATP demonstrates polymorphism of a surface antigen in malaria parasites from Sri Lankan patients.
AU Ramasamy R; Ranasinghe C
CS Division of Life Sciences, Institute of Fundamental Studies, Kandy, Sri Lanka.
SO BIOCHIMICA ET BIOPHYSICA ACTA, (1994 Oct 21) 1227 (1-2) 28-32.
Journal code: 0217513. ISSN: 0006-3002.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-X76087; GENBANK-X76298
EM 199411
ED Entered STN: 19941222
Last Updated on STN: 19941222
Entered Medline: 19941123
AB Structural diversity in a 45 kDa surface antigen on **Plasmodium falciparum** merozoites (termed GYMSSA, **MSP**-2 or MSA-2) and other candidate molecules for developing a malaria **vaccine** need to be investigated in parasites obtained directly from patients in different malaria endemic countries. A double-stranded DNA sequencing method suitable for this purpose, and also for studying diversity in genes of other haploid cells, is described. A first round polymerase chain reaction (PCR) on DNA isolated from blood was carried out with a primer containing the GCN4 binding site to amplify and subsequently purify the coding region of the MSA-2 gene on GCN4 coated tubes. A second round PCR with more internal primers incorporating M13 forward and reverse primer sequences was then performed. Cycle sequencing was done with unlabelled M13 primers and [alpha-35S]dATP by the dideoxynucleotide procedure. Two different allelic forms of MSA-2 were identified in samples of **Plasmodium falciparum** from patients in Sri Lanka.

L16 ANSWER 172 OF 195 MEDLINE on STN
AN 93328298 MEDLINE
DN 93328298 PubMed ID: 7687586
TI Immunological cross-reactivity of the C-terminal 42-kilodalton fragment of **Plasmodium falciparum merozoite surface protein** 1 expressed in baculovirus.
AU Hui G S; Hashiro C; Nikaido C; Case S E; Hashimoto A; Gibson H; Barr P J; Chang S P
CS Department of Tropical Medicine, University of Hawaii, Honolulu 96816.
NC AI27130 (NIAID)
AI30589 (NIAID)
SO INFECTION AND IMMUNITY, (1993 Aug) 61 (8) 3403-11.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199308
ED Entered STN: 19930903
Last Updated on STN: 19990129
Entered Medline: 19930826
AB The roles of allelic and conserved epitopes in **vaccine**-induced immunity to the C-terminal 42-kDa fragment of the **Plasmodium falciparum merozoite surface protein** 1 (MSP1) were investigated. The C-terminal fragment of MSP1 was expressed as a baculovirus recombinant protein, BVp42. Rabbits were immunized with BVp42, and antibodies were tested for reactivity to MSP1s of the

homologous and heterologous allelic forms, represented by the FUP, FVO, FC27, and Honduras parasite isolates, by enzyme-linked immunosorbent assay and indirect immunofluorescence antibody assay. Despite the fact that allelic sequences accounted for approximately 50% of the BVp42 molecule, anti-BVp42 antibodies cross-reacted extensively with parasites carrying heterologous MSP1 alleles. Enzyme-linked immunosorbent inhibition assays confirmed that an overwhelming majority of the anti-BVp42 antibodies were cross-reactive, suggesting that determinants within conserved block 17 are dominant B-cell epitopes in the anti-BVp42 response. Moreover, the BVp42 polypeptide could inhibit (> 90%) the cross-reactivity of anti-MSP1 antibodies in animals immunized with the complete native MSP1 protein. Anti-BVp42 antibodies were equally effective in inhibiting the in vitro growth of parasites carrying homologous or heterologous MSP1 alleles. Serotyping by monoclonal antibodies indicated that the immunological and biological cross-reactivities were not caused by identical variant-specific amino acid substitutions within conserved block 17. These results should provide the impetus to develop a **vaccine** based on the C-terminal conserved region(s) of MSP1 against parasites of diverse genetic makeup.

L16 ANSWER 173 OF 195 MEDLINE on STN
AN 94127083 MEDLINE
DN 94127083 PubMed ID: 8296485
TI Co-dominant and reciprocal T-helper cell activity of epitopic sequences and formation of junctional B-cell determinants in synthetic T:B chimeric immunogens.
AU Sharma P; Kumar A; Batni S; Chauhan V S
CS International Centre for Genetic Engineering and Biotechnology, Aruna Asaf Ali Marg, New Delhi, India.
SO VACCINE, (1993 Oct) 11 (13) 1321-6.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199402
ED Entered STN: 19940314
Last Updated on STN: 19990129
Entered Medline: 19940225
AB The identification of defined T-helper (Th) cell determinants, particularly those recognized in the context of several MHC or HLA haplotypes, and their use to provide effective carrier help to short synthetic constructs representing a B-cell epitope have made it feasible to synthesize putatively potent immunogens. However, a number of crucial questions regarding immunogenicity of epitopic sequences need to be addressed before an optimally effective synthetic **vaccine** can be designed. The present study deals with the hybrid constructs incorporating a known B-cell epitope from the **merozoite surface protein**-1 (**MSP**-1) of a human malarial parasite, **Plasmodium falciparum**, and the promiscuous Th-cell epitope from tetanus toxin or from the circumsporozoite protein of P. falciparum. Here, we provide data which suggest that B- and T-cell determinants present in a hybrid construct could, in fact, provide reciprocal helper activity for antibody production; that antibodies to a Th-cell epitope may not necessarily block its helper function; and that junctional B-cell epitopes may be formed. All this may influence, in an unpredictable manner, the quality of protective immune response sought to be generated using the chimeric immunogens, with important implications for **vaccine** design.

L16 ANSWER 174 OF 195 MEDLINE on STN
AN 93341908 MEDLINE
DN 93341908 PubMed ID: 8341580

TI Immunogenicity of a hybrid **Plasmodium falciparum** malaria antigen.
AU Lockyer M J; Cooper H; Tite J; Rowan W; Crowe J S
CS Department of Cell Biology, Wellcome Research Laboratories, Beckenham, Kent.
SO PARASITOLOGY, (1993 Jun) 106 (Pt 5) 451-7.
Journal code: 0401121. ISSN: 0031-1820.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199309
ED Entered STN: 19930917
Last Updated on STN: 19990129
Entered Medline: 19930902
AB A recombinant baculovirus-expressed hybrid protein containing epitopes for the C-terminal fragment of the **Plasmodium falciparum** precursor to the major merozoite surface antigens (PMMSA) and the tetrapeptide repeats of the circumsporozoite protein (CSP) was assessed for its immunogenicity. Murine MHC-II restriction of the antibody response to the CSP repeats was not overcome by the PMMSA component, the response to which showed no restriction. In an adjuvant trial the highest antibody titres in rabbits to both components of the hybrid were obtained using Freund's adjuvant. Lack of a boosting antibody response to the CSP repeats appeared to be linked to the conformation of the PMMSA component. Formulation of the hybrid protein into Iscoms gave antibody titres of only short duration to both components.

L16 ANSWER 175 OF 195 MEDLINE on STN
AN 93271948 MEDLINE
DN 93271948 PubMed ID: 7684635
TI Use of a recombinant baculovirus product to measure naturally-acquired human antibodies to disulphide-constrained epitopes on the P. falciparum **merozoite surface protein**-1 (MSP1).
AU Blackman M J; Holder A A
CS National Institute for Medical Research, Mill Hill, London, UK.
SO FEMS IMMUNOLOGY AND MEDICAL MICROBIOLOGY, (1993 Apr) 6 (4) 307-15.
Journal code: 9315554. ISSN: 0928-8244.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199306
ED Entered STN: 19930716
Last Updated on STN: 19990129
Entered Medline: 19930629
AB An enzyme-linked immunosorbent assay (ELISA) has been developed to measure antibody levels in human sera to a candidate **vaccine** antigen, **merozoite surface protein**-1 (MSP1), of the malaria parasite **Plasmodium falciparum**. To ensure the detection of antibodies reactive with important conformational epitopes, antigens used in the ELISA were obtained from either in vitro parasite cultures, or from a baculovirus expression system in which correct folding of recombinant MSP1-derived polypeptides has been previously demonstrated. The specificity of the ELISA was confirmed using a novel antibody affinity select method. The assay was used to investigate the pattern of acquisition of anti-MSP1 antibodies in a cross-sectional survey of 387 3-8 year old residents of a malaria endemic area of The Gambia. A significant positive correlation between anti-MSP1 antibody levels and age was evident, though individual responses to two antigens corresponding to two distinct domains of the MSP1 varied widely.

L16 ANSWER 176 OF 195 MEDLINE on STN

AN 94049988 MEDLINE
DN 94049988 PubMed ID: 7694147
TI Monoclonal antibodies that inhibit **Plasmodium falciparum** invasion in vitro recognise the first growth factor-like domain of **merozoite surface protein**-1.
AU Chappel J A; Holder A A
CS Division of Parasitology, National Institute for Medical Research, Mill Hill, London, UK.
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (1993 Aug) 60 (2) 303-11. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199311
ED Entered STN: 19940117
Last Updated on STN: 20000303
Entered Medline: 19931126
AB A major protein found on the surface of the invasive stage of the malaria parasite **Plasmodium falciparum, merozoite surface protein**-1 (MSP1), has been proposed as a **vaccine** candidate. Antibodies which recognise a single fragment of this molecule (MSP1(19)), composed of 2 regions related to epidermal growth factor (EGF), also inhibit parasite growth in vitro. It is shown by direct expression of the individual EGF-like domains in Escherichia coli, that the first domain is the target of growth-inhibitory antibodies. A single amino acid difference influences the binding of some antibodies to this domain.

L16 ANSWER 177 OF 195 MEDLINE on STN
AN 93281363 MEDLINE
DN 93281363 PubMed ID: 7685076
TI Synthetic peptides based on conserved **Plasmodium falciparum** antigens are immunogenic and protective against Plasmodium yoelii malaria.
AU Chauhan V S; Chatterjee S; Johar P K
CS International Centre for Genetic Engineering & Biotechnology, New Delhi, India.
SO PARASITE IMMUNOLOGY, (1993 Apr) 15 (4) 239-42. Journal code: 7910948. ISSN: 0141-9838.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199307
ED Entered STN: 19930716
Last Updated on STN: 19990129
Entered Medline: 19930708
AB Two synthetic polypeptides containing multiple B- and T-cell epitopes derived from the conserved regions of two **vaccine** candidate antigens namely MSA-1 and RESA of human malarial parasite P. falciparum were studied for immunogenicity and protectivity. Both constructs elicited strong antibody and lymphocyte proliferation responses in BALB/c mice immunized with the carrier-free peptides. In an ELISA, these peptides also bound antibodies present in the sera from the P. vivax infected humans as well as from the P. yoelii infected mice. Significantly, our data showed that immunization of mice with these P. falciparum peptide could impart partial protection against P. yoelii challenge infection. Our finding that synthetic peptides representing portions of P. falciparum antigens were capable of stimulating protective immune responses against rodent malaria suggests that murine malaria model P. yoelii may provide a suitable system for primary screening of potentially protective synthetic immunogens.

L16 ANSWER 178 OF 195 MEDLINE on STN
AN 93115653 MEDLINE
DN 93115653 PubMed ID: 8418196
TI Signal transduction in host cells by a glycosylphosphatidylinositol toxin of malaria parasites.
AU Schofield L; Hackett F
CS National Institute for Medical Research, London, United Kingdom.
SO JOURNAL OF EXPERIMENTAL MEDICINE, (1993 Jan 1) 177 (1) 145-53.
Journal code: 2985109R. ISSN: 0022-1007.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199302
ED Entered STN: 19930219
Last Updated on STN: 19990129
Entered Medline: 19930201
AB In this study, we have identified a dominant glycolipid toxin of **Plasmodium falciparum**. It is a glycosylphosphatidylinositol (GPI). The parasite GPI moiety, free or associated with protein, induces tumor necrosis factor and interleukin 1 production by macrophages and regulates glucose metabolism in adipocytes. Deacylation with specific phospholipases abolishes cytokine induction, as do inhibitors of protein kinase C. When administered to mice in vivo the parasite GPI induces cytokine release, a transient pyrexia, and hypoglycemia. When administered with sensitizing agents it can elicit a profound and lethal cachexia. Thus, the GPI of Plasmodium is a potent glycolipid toxin that may be responsible for a novel pathogenic process, exerting pleiotropic effects on a variety of host cells by substituting for the endogenous GPI-based second messenger/signal transduction pathways. Antibody to the GPI inhibits these toxic activities, suggesting a rational basis for the development of an antiglycolipid **vaccine** against malaria.

L16 ANSWER 179 OF 195 MEDLINE on STN
AN 93302975 MEDLINE
DN 93302975 PubMed ID: 7686280
TI Identifying polymorphic regions of the p190 protein from different **Plasmodium falciparum** strains by using specific T cells.
AU Suss G; Matile H; Meloen R H; Takacs B; Pink J R
CS Department of Biology, F. Hoffmann-La Roche Ltd., Basle, Switzerland.
SO PARASITE IMMUNOLOGY, (1993 Mar) 15 (3) 127-34.
Journal code: 7910948. ISSN: 0141-9838.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199307
ED Entered STN: 19930813
Last Updated on STN: 19990129
Entered Medline: 19930726
AB The p190 protein (also called MSA1 or MSP1) of the asexual blood stage forms of **Plasmodium falciparum**, a human malaria **vaccine** candidate, shows polymorphism between different isolates. Mice were immunized with p190-3, a recombinant protein which contains mostly conserved sequences derived from the p190 protein of the K1 parasite isolate. Proliferative T-cell responses of lymph node cells from immunized mice were assessed by stimulation in vitro with p190-3 or preparations of parasitized red blood cells (PRBC) containing the native protein. The p190-3-specific T cells from C57BL/6 mice consistently responded to some P. falciparum isolates, representing either the K1 or MAD20 serotype of p190, but not to other P. falciparum strains or to

rodent malaria parasite-infected red blood cells. p190-3-specific T-cell responses from other mouse strains (BALB/c, C3H/He) did not distinguish between P. falciparum isolates. The polymorphic epitopes which were preferentially recognized by T cells from C57BL/6 mice were identified.

L16 ANSWER 180 OF 195 MEDLINE on STN
AN 93295445 MEDLINE
DN 93295445 PubMed ID: 8515786
TI Sequence conservation in the C-terminal part of the precursor to the major **merozoite surface proteins** (MSP1) of **Plasmodium falciparum** from field isolates.
AU Jongwutiwes S; Tanabe K; Kanbara H
CS Department of Protozoology, Nagasaki University, Japan.
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (1993 May) 59 (1) 95-100. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-D13343; GENBANK-D13344; GENBANK-D13345; GENBANK-D13346; GENBANK-D13347; GENBANK-D13348; GENBANK-D13349; GENBANK-D13350; GENBANK-D13351; GENBANK-D13352; GENBANK-D13353; GENBANK-D13354; GENBANK-D13355; GENBANK-D13356; GENBANK-D13357; GENBANK-D13358; GENBANK-D13359; GENBANK-D13360; GENBANK-D13361; GENBANK-D13362; GENBANK-D13363
EM 199307
ED Entered STN: 19930806
Last Updated on STN: 19990129
Entered Medline: 19930720
AB The C-terminal part of the precursor to the major **merozoite surface proteins** (MSP1) of **Plasmodium falciparum** contains potential protective epitopes and two cleavage sites for processing which take place prior to erythrocyte invasion by the merozoite. Since sequences available to date are limited and derived from cultured parasites, we have examined the extent of variations of this important part of the MSP1 gene from natural populations. Our sequence analyses of 1.6-1.7 kb from blocks 13-17 of the gene obtained from 19 Thai wild isolates have identified a deletion of a codon and 18 nucleotide substitutions, all of which are dimorphic substitutions and all but one create amino acid exchanges. However, residues at two cleavage sites for the C-terminus 42 kDa polypeptide and the 19-kDa polypeptide, a subfragment of the former, are conserved. Furthermore, all 12 cysteine residues at the C-terminal 19-kDa polypeptide are perfectly conserved, allowing the formation of 2 epidermal growth factor-like structures. These results indicate that in contrast to extensive variations at the N-terminal part of MSP1, limited variations occur at the C-terminal part.

L16 ANSWER 181 OF 195 MEDLINE on STN
AN 93295427 MEDLINE
DN 93295427 PubMed ID: 8515771
TI Analysis of sequence diversity in the **Plasmodium falciparum merozoite surface protein** -1 (**MSP**-1).
AU Miller L H; Roberts T; Shahabuddin M; McCutchan T F
CS Laboratory of Malaria Research, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD 20892.
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (1993 May) 59 (1) 1-14. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199307

ED Entered STN: 19930806
Last Updated on STN: 19990129
Entered Medline: 19930720

AB Immunization with the first identified **Plasmodium falciparum merozoite surface protein** (**MSP**-1) protected monkeys from an otherwise fatal infection. The question of whether the high degree of diversity in **MSP**-1 among parasite clones will be an impediment to its development as a **vaccine** candidate needs to be resolved. We have aligned all published sequences, identifying errors, resequencing a portion of one parasite clone, and identifying probable duplicate sequences of four pairs of parasite clones. The sequences are displayed in a fashion that facilitates the study of variation and its potentially diverse origins. The original dimorphic sequences described by Tanabe et al. have been modified to include only common sequences throughout the entire gene. The extension of the dimorphic region to the 5' end of block 3 brings into question the involvement of intragenic crossover as the major mechanism generating allelic diversity. Additional diversity developed from point mutations and recombination in certain regions of the gene. The regions of variability and conservation should serve as a data base for planning **vaccine** trials.

L16 ANSWER 182 OF 195 MEDLINE on STN
AN 92166390 MEDLINE
DN 92166390 PubMed ID: 1371529
TI "Universal" T helper cell determinants enhance immunogenicity of a **Plasmodium falciparum** merozoite surface antigen peptide.
AU Kumar A; Arora R; Kaur P; Chauhan V S; Sharma P
CS International Centre for Genetic Engineering and Biotechnology, Shaheed Jeet Singh Marg, New Delhi, India.
SO JOURNAL OF IMMUNOLOGY, (1992 Mar 1) 148 (5) 1499-505.
Journal code: 2985117R. ISSN: 0022-1767.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199203
ED Entered STN: 19920417
Last Updated on STN: 19980206
Entered Medline: 19920330

AB Synthetic peptide constructs containing a limited number of epitopes are being currently investigated as subunit **vaccines** against a variety of pathogens. However, because of widespread nonresponsiveness to most such constructs, possibly attributable to MHC restriction, the choice of appropriate carrier molecules to enhance immunogenicity of peptides constitutes an important and essential aspect of designing synthetic immunogens for human use. Widely used **vaccines** such as tetanus toxoid (TT) have not been uniformly effective as carrier proteins because of the phenomenon of epitope-specific suppression in which induction of an immune response against a synthetic peptide conjugated to TT is prevented by preexisting immunity to TT. Recently, T cell determinants that can be recognized in the context of several class II MHC molecules have been identified in tetanus toxin as well as in the circumsporozoite protein of a human malarial parasite, **Plasmodium falciparum**. Such determinants can be potentially used to circumvent the problem of epitope-specific suppression. In the present study we evaluated two such T cell determinants, viz., tt830-844 from tetanus toxin and CST3 from the malarial parasite, for their ability to help induce a boostable antibody response and to overcome genetic nonresponsiveness to a synthetic 20-residue construct containing a B cell and an overlapping T cell epitope from a major **merozoite surface protein** of P. falciparum. Our data provide support for the view that widely recognized T cell determinants may be used as universal carrier molecules for general

vaccination.

L16 ANSWER 183 OF 195 MEDLINE on STN
AN 92192814 MEDLINE
DN 92192814 PubMed ID: 1548068
TI Roles of conserved and allelic regions of the major **merozoite surface protein** (gp195) in immunity against **Plasmodium falciparum**.
AU Hui G S; Hashimoto A; Chang S P
CS Department of Tropical Medicine, School of Medicine, University of Hawaii, Honolulu 96816.
NC AI-27130-01A1 (NIAID)
SO INFECTION AND IMMUNITY, (1992 Apr) 60 (4) 1422-33.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-M63185; GENBANK-M63610; GENBANK-M63611; GENBANK-M63612; GENBANK-M63613; GENBANK-M63614; GENBANK-M63615; GENBANK-M63616; GENBANK-M63617; GENBANK-M83091; GENBANK-X63185
EM 199204
ED Entered STN: 19920509
Last Updated on STN: 19970203
Entered Medline: 19920423
AB The **Plasmodium falciparum** major **merozoite surface protein** gp195 is a candidate antigen for a **vaccine** against human malaria. The significance of allelism and polymorphism in **vaccine**-induced immunity to gp195 was investigated in this study. Rabbits were immunized with each of two allelic forms of gp195 that were affinity purified from the FUP and FVO parasite isolates. gp195-specific antibodies raised against one allelic form of gp195 cross-reacted extensively with the gp195 of the heterologous allele in enzyme-linked immunosorbent assays (ELISAs) and immunofluorescence assays. Competitive binding ELISAs with homologous and heterologous gp195s confirmed that a majority of the anti-gp195 antibodies produced against either allelic protein were cross-reactive. Moreover, the biological activities of the gp195 antibody responses were also highly cross-reactive, since anti-gp195 sera inhibited the in vitro growth of the homologous and heterologous parasites with equal efficiency. The degree of cross-reactivity with strain-specific and allele-specific determinants of gp195 in the ELISA was low. These results suggest that the immunological cross-reactivity between the two gp195 proteins is due to recognition of conserved determinants. They also suggest that a gp195-based **vaccine** may be effective against blood-stage infection with a diverse array of parasite isolates.

L16 ANSWER 184 OF 195 MEDLINE on STN
AN 93000617 MEDLINE
DN 93000617 PubMed ID: 1388845
TI Malaria **vaccines**.
AU Romero P
CS Ludwig Institute for Cancer Research, Lausanne, Switzerland.
SO CURRENT OPINION IN IMMUNOLOGY, (1992 Aug) 4 (4) 432-41. Ref: 92
Journal code: 8900118. ISSN: 0952-7915.
CY ENGLAND: United Kingdom
DT (CLINICAL TRIAL)
Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, ACADEMIC)
LA English
FS Priority Journals
EM 199210

ED Entered STN: 19930122
Last Updated on STN: 19990129
Entered Medline: 19921029
AB The development of an effective malaria **vaccine** is a feasible goal. Most of the **vaccines** being developed today are subunit **vaccines** derived from selected parasite antigens or their immunologically active fragments. The precise characterization of protective immune responses against Plasmodium parasites remains a fundamental part of present research aimed at obtaining a malaria **vaccine**(s).

L16 ANSWER 185 OF 195 MEDLINE on STN
AN 94142603 MEDLINE
DN 94142603 PubMed ID: 1343722
TI Efficiency of human **Plasmodium falciparum** malaria **vaccine** candidates in Aotus lemurinus monkeys.
AU Herrera S; Herrera M A; Certa U; Corredor A; Guerrero R
CS Depto. de Microbiologia, Universidad del Valle, Cali, Colombia.
SO MEMORIAS DO INSTITUTO OSWALDO CRUZ, (1992) 87 Suppl 3 423-8.
Journal code: 7502619. ISSN: 0074-0276.
CY Brazil
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199403
ED Entered STN: 19940330
Last Updated on STN: 19990129
Entered Medline: 19940311
AB The protective efficacy of several recombinant and a synthetic **Plasmodium falciparum** protein was assessed in Aotus monkeys. The rp41 aldolase, the 190L fragment of the MSA-1 protein and fusion 190L-CS. T3 protein containing the CS.T3 helper "universal" epitope were emulsified in Freund's adjuvants and injected 3 times in groups of 4-5 monkeys each one. The synthetic polymer Spf (66)30 also emulsified in Freund's adjuvants was injected 6 times. Control groups for both experiments were immunized with saline solution in the same adjuvant following the same schedules. Serology for malaria specific antibodies showed seroconversion in monkeys immunized with the recombinant proteins but not in those immunized with the polymer nor in the controls. Challenge was performed with the 10(5) parasites from the P. falciparum FVO isolate. Neither rp41 nor Spf(66)30 induced protection, whereas 190L induced significant delay of parasitemia. The fusion of the CS.T3 epitope to 190L significantly increased its protective capacity.

L16 ANSWER 186 OF 195 MEDLINE on STN
AN 94142602 MEDLINE
DN 94142602 PubMed ID: 1343721
TI Protection of Aotus monkeys after immunization with recombinant antigens of **Plasmodium falciparum**.
AU Enders B; Hundt E; Knapp B
CS Behringwerke AG, Research Laboratories, Marburg, Germany.
SO MEMORIAS DO INSTITUTO OSWALDO CRUZ, (1992) 87 Suppl 3 413-22.
Journal code: 7502619. ISSN: 0074-0276.
CY Brazil
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199403
ED Entered STN: 19940330
Last Updated on STN: 20000907
Entered Medline: 19940311
AB The genus Aotus spp. (owl monkey) is one of the WHO recommended experimental models for **Plasmodium falciparum** blood

stage infection, especially relevant for vaccination studies with asexual blood stage antigens of this parasite. For several immunization trials with purified recombinant merozoite/schizont antigens, the susceptible Aotus karyotypes II, III, IV and VI were immunized with Escherichia coli derived fusion proteins containing partial sequences of the proteins MSAI (merozoite surface antigen I), SERP (serine-stretch protein) and HRPII (histidine alanine rich protein II) as well as with a group of recombinant antigens obtained by an antiserum raised against a protective 41 kD protein band. The subcutaneous application (3x) of the antigen preparations was carried out in intact animals followed by splenectomy prior to challenge, in order to increase the susceptibility of the experimental hosts to the parasite. A partial sequence of HRPII, the combination of three different fusion proteins of the 41 kD group and a mixture of two sequences of SERP in the presence of a modified Al(OH)3 adjuvant conferred significant protection against a challenge infection with P. falciparum blood stages (2-5 x 10(6)) i. RBC). Monkeys immunized with the MS2-fusion protein carrying the N-terminal part of the 195 kD precursor of the major merozoite surface antigens induced only marginal protection showing some correlation between antibody titer and degree of parasitaemia. Based on the protective capacity of these recombinant antigens we have expressed two hybrid proteins (MS2/SERP/HRPII and SERP/MSAI/HRPII) in E. coli containing selected partial sequences of SERP, HRPII and MSAI. Antibodies raised against both hybrid proteins in rabbits and Aotus monkeys recognize the corresponding schizont polypeptides. In two independent immunization trials using 13 animals (age 7 months to 3 years) we could show that immunization of Aotus monkeys with either of the two hybrid proteins administered in an oil-based well tolerated formulation protected the animals from a severe experimental P. falciparum (strain Palo Alto) infection.

L16 ANSWER 187 OF 195 MEDLINE on STN
AN 92091775 MEDLINE
DN 92091775 PubMed ID: 1727867
TI Protective immunization with invariant peptides of the **Plasmodium falciparum** antigen MSA2.
CM Erratum in: J Immunol 1995 Apr 15;154(8):4223
AU Saul A; Lord R; Jones G L; Spencer L
CS Tropical Health Program, Queensland Institute of Medical Research, Brisbane, Australia.
SO JOURNAL OF IMMUNOLOGY, (1992 Jan 1) 148 (1) 208-11.
Journal code: 2985117R. ISSN: 0022-1767.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199201
ED Entered STN: 19920216
Last Updated on STN: 20000303
Entered Medline: 19920127
AB Three octapeptides from the N and C terminal C regions of the merozoite surface Ag 2 (MSA2) of **Plasmodium falciparum** elicit anti-MSA2 antibody when given as diphtheria toxoid conjugates. These antibodies also bind to the MSA2 homolog from the rodent malaria Plasmodium berghei. All mice vaccinated with these conjugates and challenged with an otherwise lethal inoculum of P. berghei showed substantial protection with most surviving. There was a inverse correlation between the development of the parasitemia and the antibody titer, with alum, algammulin, and CFA giving comparable results. These observations show that the conserved region of MSA2 could form the basis of a malaria **vaccine** when presented in a suitably immunogenic form, thus avoiding the problems of antigenic diversity [corrected].

L16 ANSWER 188 OF 195 MEDLINE on STN

AN 92155298 MEDLINE
DN 92155298 PubMed ID: 1346766
TI **Plasmodium falciparum**: in vitro characterization and human infectivity of a cloned line.
AU Davis J R; Cortese J F; Herrington D A; Murphy J R; Clyde D F; Thomas A W; Baqar S; Cochran M A; Thanassi J; Levine M M
CS Department of Medicine, University of Maryland School of Medicine, Baltimore 21201.
SO EXPERIMENTAL PARASITOLOGY, (1992 Mar) 74 (2) 159-68.
Journal code: 0370713. ISSN: 0014-4894.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-M83886; GENBANK-S50854; GENBANK-S50855; GENBANK-S53164; GENBANK-S90657; GENBANK-S90659; GENBANK-S90758; GENBANK-S90759; GENBANK-X67411; GENBANK-X67412
EM 199203
ED Entered STN: 19920410
Last Updated on STN: 20000303
Entered Medline: 19920324
AB The culture-adapted NF54 isolate of **Plasmodium falciparum** was subjected in vitro to three sequential limiting dilution titrations and the resulting clone was given the designation CVD1. DNA sequence analysis of the gene encoding the circumsporozoite (CS) protein revealed differences between CVD1 and the published NF54 CS gene. CVD1 had 1191 bp, 397 amino acids, and 42 repeat units while NF54 had 1218 bp, 405 amino acids, and 44 repeat units. The CVD1 clone was more sensitive to chloroquine than was the parental line, in vitro. Anopheles stephensi mosquitoes were infected equally by the cloned and uncloned parasites. Volunteers were readily infected by NF54 and CVD1 following infectious mosquito bites. The availability of a well-characterized, chloroquine-sensitive clone which safety infects humans should facilitate performance of experimental challenge studies to assess **vaccine** efficacy.

L16 ANSWER 189 OF 195 MEDLINE on STN
AN 92043781 MEDLINE
DN 92043781 PubMed ID: 1940375
TI Influence of adjuvants on the antibody specificity to the **Plasmodium falciparum** major **merozoite surface protein**, gp195.
AU Hui G S; Chang S P; Gibson H; Hashimoto A; Hashiro C; Barr P J; Kotani S
CS Department of Tropical Medicine, School of Medicine, University of Hawaii, Honolulu 96816.
NC AI-27130-01A1 (NIAID)
SO JOURNAL OF IMMUNOLOGY, (1991 Dec 1) 147 (11) 3935-41.
Journal code: 2985117R. ISSN: 0022-1767.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199112
ED Entered STN: 19920124
Last Updated on STN: 19920124
Entered Medline: 19911218
AB The effect of adjuvants on the specificity of immune responses to the **Plasmodium falciparum** gp195 protein was investigated using adjuvant formulations based on synthetic muramyl dipeptide and monophosphoryl lipid A derivatives, in parallel with CFA and alum. Although these immunomodulators were as effective as CFA in inducing an antibody response to gp195, there were distinct differences in the recognition of B cell epitopes by these antibody populations. We have

also demonstrated that MHC control of antibody specificity can be related to the adjuvant used for immunization. In general, the potency of adjuvants, their ability to induce antibodies of a particular specificity, or their ability to overcome MHC control of immune responsiveness varied independently. These findings suggest a critical role of adjuvants in the determination of the specificity of the immune response to protein Ag. Thus, the influence of adjuvants should be a major consideration in studies on immunologic recognition, as well as in the design of modern subunit **vaccines**.

L16 ANSWER 190 OF 195 MEDLINE on STN
AN 91372956 MEDLINE
DN 91372956 PubMed ID: 1894356
TI Ability of recombinant or native proteins to protect monkeys against heterologous challenge with **Plasmodium falciparum**.
AU Etlinger H M; Caspers P; Matile H; Schoenfeld H J; Stueber D; Takacs B
CS Central Research Units, F. Hoffmann LaRoche Ltd., Basel, Switzerland.
SO INFECTION AND IMMUNITY, (1991 Oct) 59 (10) 3498-503.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199110
ED Entered STN: 19911108
Last Updated on STN: 19911108
Entered Medline: 19911021
AB To circumvent problems associated with polymorphic **vaccine** candidates for **Plasmodium falciparum** malaria, we evaluated recombinant proteins representing sequences from relatively high conserved regions of the precursor to the major **merozoite surface proteins**, gp190, for their ability to protect Saimiri monkeys against malaria challenge. Recombinant proteins represented amino acid residues 147 to 321 (p190-1) or 147 to 321 and 1060 to 1195 (p190-3), and their efficacy was compared with that of native gp190 and its processed products. All antigens were derived from P. falciparum K1, a Thai isolate, while the challenge strain was Palo Alto (from Uganda, Africa), which contains, with the exception of the N-terminal 375 amino acids, which are almost identical to the K1 sequence, essentially the MAD-20 allelic form of gp190. By 12 days following challenge, each control monkey required drug treatment. Three monkeys injected with p190-3 required therapy, while one cleared the parasites without therapy. Two monkeys injected with p190-1 received therapy on day 14, while the remaining two cleared the parasites without therapy. Of four animals injected with native gp190, because of health reasons unrelated to malaria, one was not challenged with parasites and one was removed from the study 8 days after challenge when its parasitemia was 1.1% (parasitemias in control animals ranged from 4.3 to 9%); the remaining two cleared the parasites after maximum parasitemias of 0.45 and 0.53%. The highest levels of antiparasite antibody were produced by animals immunized with native gp190. There was a significant correlation between monkeys which did not require drug treatment and antiparasite antibody. These results may suggest that native gp190 and/or its processed products can provide excellent protection against heterologous challenge and that antibody is important for protection. The challenge for **vaccine** development is to identify the protective sequence(s).

L16 ANSWER 191 OF 195 MEDLINE on STN
AN 91209907 MEDLINE
DN 91209907 PubMed ID: 2019429
TI Synthetic low-toxicity muramyl dipeptide and monophosphoryl lipid A replace Freund complete adjuvant in inducing growth-inhibitory antibodies

to the **Plasmodium falciparum** major **merozoite surface protein**, gp195.

AU Hui G S; Tam L Q; Chang S P; Case S E; Hashiro C; Siddiqui W A; Shiba T; Kusumoto S; Kotani S

CS Department of Tropical Medicine, School of Medicine, University of Hawaii, Honolulu 96816.

SO INFECTION AND IMMUNITY, (1991 May) 59 (5) 1585-91.
Journal code: 0246127. ISSN: 0019-9567.

CY United States

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

EM 199105

ED Entered STN: 19910616
Last Updated on STN: 19910616
Entered Medline: 19910528

AB The **Plasmodium falciparum** major **merozoite surface protein** (gp195) is a protective antigen against lethal malaria. However, increasing evidence indicates that the efficacy of a malaria **vaccine** will require a strong adjuvant that is safe for human use. We compared the efficacies of two low-toxicity synthetic immunomodulators, B30-MDP (a lipophilic muramyl dipeptide derivative) and LA-15-PH (a synthetic equivalent of monophosphoryl lipid A), with that of Freund complete adjuvant (FCA) in eliciting an antibody response to gp195. Rabbits were immunized with native gp195 and B30-MDP, LA-15-PH, or the two in combination, with liposomes as the vehicle. Aluminum hydroxide and FCA were used as reference adjuvants. Results showed that adjuvant formulations based on B30-MDP alone or in combination with LA-15-PH induced high antibody titers to gp195, as compared with FCA. LA-15-PH alone was less effective. Aluminum hydroxide induced significantly lower antibody titers. The functional activity of the rabbit anti-gp195 antibodies induced by different adjuvants was evaluated in an in vitro parasite growth inhibition assay previously shown to correlate with anti-gp195 immunity in the Aotus monkey model. All rabbits immunized with B30-MDP-LA-15-PH and two of three rabbits immunized with B30-MDP alone produced sera that strongly inhibited parasite growth. The degree of growth inhibition was similar to that with FCA. The antibody titers of the rabbits receiving B30-MDP-LA-15-PH strongly correlated with the degree of in vitro growth inhibition. Our findings provided strong evidence that adjuvant formulations based on synthetic B30-MDP and LA-15-PH can replace FCA as adjuvants in stimulating protective immunity specific for gp195.

L16 ANSWER 192 OF 195 MEDLINE on STN

AN 92188893 MEDLINE

DN 92188893 PubMed ID: 1799171

TI Towards a malaria **vaccine**: what is in sight?.

AU del Giudice G

CS World Health Organization-Immunology Research and Training Centre, Department of Pathology, University of Geneva.

SO ALLERGOLOGIA ET IMMUNOPATHOLOGIA, (1991 May-Jun) 19 (3) 129-35. Ref: 57
Journal code: 0370073. ISSN: 0301-0546.

CY Spain

DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)

LA English

FS Priority Journals

EM 199204

ED Entered STN: 19920424
Last Updated on STN: 19990129
Entered Medline: 19920416

L16 ANSWER 193 OF 195 MEDLINE on STN

AN 92320881 MEDLINE
DN 92320881 PubMed ID: 1820719
TI Selection of genetic variants from Plasmodium clones.
AU Dolan S A; Miller L H; Wellems T E
CS Laboratory of Parasitic Diseases, National Institutes of Health, Bethesda, MD 20892.
SO ACTA LEIDENSIA, (1991) 60 (1) 93-9. Ref: 22
Journal code: 0413650. ISSN: 0065-1362.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 199207
ED Entered STN: 19920815
Last Updated on STN: 19920815
Entered Medline: 19920731
AB Clones of Plasmodium alter their antigenic profile or invasion phenotype when presented with specific challenges. Two examples are reviewed which may represent different genetic mechanisms of adaptation to selection pressures. In one series of experiments, rhesus monkeys were vaccinated with a 143,000/140,000 Mr P. knowlesi **merozoite surface protein** and then infected with a parasite clone expressing this protein. Primary parasitemia was controlled, but subsequent waves of parasitemia developed from populations of parasites harboring mutations in the 143,000/140,000 Mr gene. Mutations in this gene may be occurring at a continual low rate in the population (as with any normal gene) and particular mutations may have been selected in the vaccinated monkeys. In other experiments, P. falciparum parasite lines were selected from a clone (Dd2) that initially exhibited low rates of invasion into erythrocytes made sialic-acid deficient by neuraminidase treatment. After several growth cycles in neuraminidase-treated erythrocytes, a switch was observed and parasite lines were recovered that invaded neuraminidase-treated and normal erythrocytes at the same rate. The switch mechanism in invasion may represent another aspect of genetic variation, i.e. a programmed response in which certain genes are activated or rearranged. **Vaccine** trials in the future should include studies on the selection of mutations in the target antigen. Where switching mechanisms exist, knowledge of the genetic mechanisms that produce these adaptive responses will advance analysis of prospective **vaccine** candidates and contribute to our understanding of parasite biology.

L16 ANSWER 194 OF 195 MEDLINE on STN
AN 91131149 MEDLINE
DN 91131149 PubMed ID: 2283157
TI Malaria antigens and MHC restriction.
AU Sinigaglia F; Guttinger M; Romagnoli P; Takacs B
CS Central Research Unit, F. Hoffmann-La Roche Ltd., Basel, Switzerland.
SO IMMUNOLOGY LETTERS, (1990 Aug) 25 (1-3) 265-70. Ref: 25
Journal code: 7910006. ISSN: 0165-2478.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 199103
ED Entered STN: 19910405
Last Updated on STN: 19980206
Entered Medline: 19910320
AB In the case of the malaria CS protein we have shown that there is at least one T cell determinant which is able to bind to and be recognized by most

human MHC class II molecules, while for the 190L polypeptide, derived from a conserved region of the p190 **merozoite surface protein**, we have identified several epitopes recognized by T cell clones in association with different HLA-class II isotypes and alleles. In addition, binding analysis of these epitopes indicated that most of the peptides are able to bind to multiple allelic forms of class II molecules. Although there are important obstacles to malaria **vaccine** development we believe that, in the light of these results, unresponsiveness in humans, caused by MHC restriction, might not be a major constraint in development of a subunit **vaccine**.

L16 ANSWER 195 OF 195 MEDLINE on STN
AN 91131130 MEDLINE
DN 91131130 PubMed ID: 1704345
TI Amino acid sequences recognized by T cells: studies on a merozoite surface antigen from the FCQ-27/PNG isolate of **Plasmodium falciparum**.
AU Rzepczyk C M; Csurhes P A; Baxter E P; Doran T J; Irving D O; Kere N
CS Queensland Institute of Medical Research, Brisbane, Australia.
SO IMMUNOLOGY LETTERS, (1990 Aug) 25 (1-3) 155-63.
Journal code: 7910006. ISSN: 0165-2478.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199103
ED Entered STN: 19910405
Last Updated on STN: 20000303
Entered Medline: 19910320
AB Twenty-six overlapping peptides, spanning the entire FCQ-27/PNG sequence of the **Plasmodium falciparum** antigen known as merozoite surface antigen 2 were screened for their ability to induce the proliferation of peripheral blood lymphocytes (PBL) obtained from 12 donors living in Honiara, Solomon Islands where P. falciparum is endemic. A recombinant (r) form of MSA2, known as Ag 1609 was also screened in these assays and tetanus toxoid (TT) antigen was included as a control. The location of the predicted T cell determinants within MSA2 was examined using the algorithm, AMPHI and by scanning MSA2 for amino acid sequences showing the Rothbard motif. There were 13 predicted amphipathic helical sites and five examples of Rothbard sequences in the antigen. The location of these with regard to the peptides tested is shown. Nine of the 12 individuals responded to TT with high stimulation indices (greater than 4) being obtained in the majority of donors. Only three individuals responded to r-MSA2 with the stimulation indices (SI) in the range of 2.4-4.1. Peptides from both the constant and variable regions of MSA2 were recognized in the proliferative assays. However, the majority of the positive proliferative responses were to peptides which spanned the central variable region which included the two copies of the 32-amino-acid repeat occurring in the antigen. High SI comparable to those obtained to TT were seen in some individuals with some peptides. There was considerable variation between donors in number and nature of the peptides recognised and two donors did not respond to any of the antigens tested. The significance of these findings to **vaccine** development is discussed.

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(FILE 'HOME' ENTERED AT 09:27:15 ON 25 AUG 2003)

FILE 'MEDLINE' ENTERED AT 09:27:28 ON 25 AUG 2003
E COHEN JOE D/AU
L1 56 S E1-E12

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L2            56 DUP REM L1 (0 DUPLICATES REMOVED)
                 E LYON JEFFREY/AU
L3             9 S E1-E9
                 E ANGOV EVELINA/AU
L4            25 S E1-E9
                 E VOSS GERALD/AU
L5             9 S E1-E5
L6             2 S L1 AND (PLASMODIUM FALCIPARUM)
L7            56 S L2
L8             2 S L2 AND (PLASMODIUM FALCIPARUM)
L9             1 S L3 AND (PLASMODIUM FALCIPARUM)
L10            2 S L4 AND (PLASMODIUM FALCIPARUM)
L11            0 S PLASMODIUM FALCIPARUM MAJOR SURFACE PROTEIN
L12        14581 S PLASMODIUM FALCIPARUM
L13          513 S L12 AND (MEROZOITE SURFACE PROTEIN OR MSP OR MSP1-42)
L14          195 S L13 AND (VACCINE)
L15           13 S L14 AND (3D7)
L16          195 DUP REM L14 (0 DUPLICATES REMOVED)
L17           13 DUP REM L15 (0 DUPLICATES REMOVED)

=> d bib ab 1-13 l17

L17  ANSWER 1 OF 13     MEDLINE on STN
AN   2003280879     MEDLINE
DN   22692432   PubMed ID: 12654909
TI   The merozoite surface protein 1 complex of
     human malaria parasite Plasmodium falciparum:
     interactions and arrangements of subunits.
AU   Kauth Christian W; Epp Christian; Bujard Hermann; Lutz Rolf
CS   Zentrum fur Molekulare Biologie der Universitat Heidelberg, Im Neuenheimer
     Feld 282, D-69120 Heidelberg, Germany.
SO   JOURNAL OF BIOLOGICAL CHEMISTRY, (2003 Jun 20) 278 (25) 22257-64.
     Journal code: 2985121R. ISSN: 0021-9258.
CY   United States
DT   Journal; Article; (JOURNAL ARTICLE)
LA   English
FS   Priority Journals
EM   200308
ED   Entered STN: 20030617
     Last Updated on STN: 20030822
     Entered Medline: 20030821
AB   The major protein component at the surface of merozoites, the infectious
     form of blood stage malaria parasites, is the merozoite
     surface protein 1 (MSP-1) complex. In the
     human malaria parasite Plasmodium falciparum, this
     complex is generated by proteolytic cleavage of a 190-kDa
     glycosylphosphatidylinositol-anchored precursor into four major fragments,
     which remain non-covalently associated. Here, we describe the in vitro
     reconstitution of the MSP-1 complex of P. falciparum strain
     3D7 from its heterologously produced subunits. We provide
     evidence for the arrangement of the subunits within the complex and show
     how they interact with each other. Our data indicate that the
     conformation assumed by the reassembled complex as well as by the
     heterologously produced 190-kDa precursor corresponds to the native one.
     Based on these results we propose a first structural model for the
     MSP-1 complex. Together with access to faithfully produced
     material, this information will advance further structure-function studies
     of MSP-1 that plays an essential role during invasion of
     erythrocytes by the parasite and that is considered a promising candidate
     for a malaria vaccine.

L17  ANSWER 2 OF 13     MEDLINE on STN
AN   2003221997     MEDLINE
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DN 22628579 PubMed ID: 12742586
TI Development and pre-clinical analysis of a **Plasmodium falciparum Merozoite Surface Protein** -1(42) malaria **vaccine**.
AU Angov Evelina; Aufiero Barbara M; Turgeon Ann Marie; Van Handenhove Michel; Ockenhouse Christian F; Kester Kent E; Walsh Douglas S; McBride Jana S; Dubois Marie-Claude; Cohen Joe; Haynes J David; Eckels Kenneth H; Heppner D Gray; Ballou W Ripley; Diggs Carter L; Lyon Jeffrey A
CS Department of Immunology, WRAIR, 503 Robert Grant Avenue, Silver Spring, MD 20910, USA.. Evelina.Angov@na.amedd.army.mil
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2003 May) 128 (2) 195-204. Journal code: 8006324. ISSN: 0166-6851.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-Z35327
EM 200308
ED Entered STN: 20030514
Last Updated on STN: 20030802
Entered Medline: 20030801
AB **Merozoite Surface Protein**-1(42) (**MSP** -1(42)) is a leading **vaccine** candidate against erythrocytic malaria parasites. We cloned and expressed **Plasmodium falciparum MSP**-1(42) (**3D7** clone) in Escherichia coli. The antigen was purified to greater than 95% homogeneity by using nickel-, Q- and carboxy-methyl (CM)-substituted resins. The final product, designated Falciparum Merozoite Protein-1 (FMP1), had endotoxin levels significantly lower than FDA standards. It was structurally correct based on binding conformation-dependent mAbs, and was stable. Functional antibodies from rabbits vaccinated with FMP1 in Freund's adjuvant inhibited parasite growth in vitro and also inhibited secondary processing of **MSP**-1(42). FMP1 formulated with GlaxoSmithKline Biologicals (GSK) adjuvant, AS02A or alum was safe and immunogenic in rhesus (Macaca mulatta) monkeys.

L17 ANSWER 3 OF 13 MEDLINE on STN
AN 2002186324 MEDLINE
DN 21918032 PubMed ID: 11920300
TI A recombinant blood-stage malaria **vaccine** reduces **Plasmodium falciparum** density and exerts selective pressure on parasite populations in a phase 1-2b trial in Papua New Guinea.
AU Genton Blaise; Betuela Inoni; Felger Ingrid; Al-Yaman Fadwa; Anders Robin F; Saul Allan; Rare Lawrence; Baisor Moses; Lorry Kerry; Brown Graham V; Pye David; Irving David O; Smith Thomas A; Beck Hans-Peter; Alpers Michael P
CS Papua New Guinea Institute of Medical Research, Maprik, Papua New Guinea.. Blaise.genton@hospvd.ch
SO JOURNAL OF INFECTIOUS DISEASES, (2002 Mar 15) 185 (6) 820-7. Journal code: 0413675. ISSN: 0022-1899.
CY United States
DT (CLINICAL TRIAL)
Journal; Article; (JOURNAL ARTICLE)
(RANDOMIZED CONTROLLED TRIAL)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 200204
ED Entered STN: 20020403
Last Updated on STN: 20030105
Entered Medline: 20020411
AB The malaria **vaccine** Combination B comprises recombinant **Plasmodium falciparum** ring-infected erythrocyte surface

antigen and 2 **merozoite surface proteins** (MSP1 and MSP2) formulated in oil-based adjuvant. A phase 1-2b double-blind, randomized, placebo-controlled trial in 120 children (5-9 years old) in Papua New Guinea demonstrated a 62% (95% confidence limits: 13%, 84%) reduction in parasite density in children not pretreated with sulfadoxine-pyrimethamine. Vaccinees had a lower prevalence of parasites carrying the MSP2-**3D7** allelic form (corresponding to that in the **vaccine**) and a higher incidence of morbid episodes associated with FC27-type parasites. These results demonstrate functional activity of Combination B against P. falciparum in individuals with previous malaria exposure. The specific effects on parasites with particular msp2 genotypes suggest that the MSP2 component, at least in part, accounted for the activity. The **vaccine**-induced selection pressure exerted on the parasites and its consequences for morbidity strongly argue for developing **vaccines** comprising conserved antigens and/or multiple components covering all important allelic types.

L17 ANSWER 4 OF 13 MEDLINE on STN
AN 2002217449 MEDLINE
DN 21951206 PubMed ID: 11953161
TI Synthesis and expression of 42 kD C-terminal region of the major **merozoite surface protein** (**MSP1** - **42**) of P. falciparum **3D7** strain in pichia pastoris.
AU Zhang Dongmei; Pan Weiqing; Lu Deru; Jiang Liping
CS Institute of Medical Biotechnology & Molecular Genetics of Second Military Medical University, Shanghai 200433 China.
SO CHUNG-HUA I HSUEH TSA CHIH [CHINESE MEDICAL JOURNAL], (2002 Feb 10) 82 (3) 198-202.
Journal code: 7511141. ISSN: 0376-2491.
CY China
DT Journal; Article; (JOURNAL ARTICLE)
LA Chinese
FS Priority Journals
EM 200207
ED Entered STN: 20020416
Last Updated on STN: 20020703
Entered Medline: 20020702
AB OBJECTIVE: Production of **3D7/MSP1** - **42** recombinant protein with correct conformation in Pichia pastoris for **vaccine** efficiency assay. METHODS: Asymmetric PCR-based method was utilized to synthesize the 1 202 bp **3D7/msp1** - **42** gene. The expressing plasmid containing the synthetic gene was introduced into Pichia pastoris by electroporation. The secreted product was detected by Western Blot. RESULTS: The redesigned entire **3D7** /**msp1** - **42** gene was generated with error-free, and expressed to produce 42 kD recombinant protein in secreted form. Conformational monoclonal antibody specific for MSP1 C-terminal can interact with the recombinant protein. CONCLUSION: The redesigned **3D7/msp1** - **42** gene was expressed in P. pastoris with full length of recombinant protein which resembled most likely to the native protein.

L17 ANSWER 5 OF 13 MEDLINE on STN
AN 2002140845 MEDLINE
DN 21830646 PubMed ID: 11841841
TI A DNA **vaccine** encoding the 42 kDa C-terminus of **merozoite surface protein** 1 of **Plasmodium falciparum** induces antibody, interferon-gamma and cytotoxic T cell responses in rhesus monkeys: immuno-stimulatory effects of granulocyte macrophage-colony stimulating factor.
AU Kumar Sanjai; Villinger Francois; Oakley Miranda; Aguiar Joao C; Jones Trevor R; Hedstrom Richard C; Gowda Kalpana; Chute John; Stowers Anthony; Kaslow David C; Thomas Elaine K; Tine John; Klinman Dennis; Hoffman

Stephen L; Weiss Walter W
CS Malaria Program, Naval Medical Research Center, Silver Spring, MD 20910, USA.. kumars@nmrc.navy.mil
SO IMMUNOLOGY LETTERS, (2002 Apr 1) 81 (1) 13-24.
Journal code: 7910006. ISSN: 0165-2478.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200208
ED Entered STN: 20020307
Last Updated on STN: 20020807
Entered Medline: 20020806
AB We have constructed a DNA plasmid **vaccine** encoding the C-terminal 42-kDa region of the **merozoite surface protein** 1 (pMSP1(42)) from the **3D7** strain of **Plasmodium falciparum** (Pf3D7). This plasmid expressed recombinant **MSP1(42)** after in vitro transfection in mouse VM92 cells. Rhesus monkeys immunized with pMSP1(42) produced antibodies reactive with Pf3D7 infected erythrocytes by IFAT, and by ELISA against yeast produced MSP1(19) (yMSP1(19)). Immunization also induced antigen specific T cell responses as measured by interferon-gamma production, and by classical CTL chromium release assays. In addition, immunization with pMSP1(42) primed animals for an enhanced antibody response to a subsequent boost with the recombinant yMSP1(19). We also evaluated Granulocyte-Macrophage Colony-Stimulating Factor (GM-CSF) as an adjuvant for pMSP1(42.) We tested both rhesus GM-CSF expressed from a DNA plasmid, and E. coli produced recombinant human GM-CSF. Plasmids encoding rhesus GM-CSF (prhGM-CSF) and human GM-CSF (phuGM-CSF) were constructed; these plasmids expressed bio-active recombinant GMCSF. Co-immunization with a mixture of prhGM-CSF and pMSP1(42) induced higher specific antibody responses after the first dose of plasmid, but after three doses of DNA monkeys immunized with or without prhGM-CSF had the same final antibody titers and T cell responses. In comparison, rhuGM-CSF protein did not lead to accelerated antibody production after the first DNA dose. However, antibody titers were maintained at a slightly higher level in monkeys receiving GM-CSF protein, and they had a higher response to boosting with recombinant MSP1(19). The GM-CSF plasmid or protein appears to be less potent as an adjuvant in rhesus monkeys than each is in mice, and more work is needed to determine if GM-CSF can be a useful adjuvant in DNA vaccination of primates.

L17 ANSWER 6 OF 13 MEDLINE on STN
AN 2000172080 MEDLINE
DN 20172080 PubMed ID: 10707101
TI Surprisingly little polymorphism in the **merozoite-surface-protein**-2 (**MSP**-2) gene of Indian **Plasmodium falciparum**.
AU Bhattacharya P R; Kumar M; Das R H
CS Malaria Research Centre, Delhi, India.
SO ANNALS OF TROPICAL MEDICINE AND PARASITOLOGY, (1999 Sep) 93 (6) 561-4.
Journal code: 2985178R. ISSN: 0003-4983.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200003
ED Entered STN: 20000330
Last Updated on STN: 20000330
Entered Medline: 20000323
AB The polymorphism in the **merozoite-surface-protein**-2 (**MSP**-2) gene of six Indian **Plasmodium falciparum** isolates was studied by PCR amplification, cloning and

sequencing. One of the isolates showed a deletion of 63 bp and all showed point mutations, although some of these mutations were silent. All the isolates also exhibited 5' and 3' conserved regions, with the two 32-mer amino-acid repeats characteristic of the FC27 family, and none belonged to the IC-1/**3D7** family. Although the **MSP**-2 genes of these isolates represent new allelic sequences, they belong to the FC27 family and show remarkably little variation.

L17 ANSWER 7 OF 13 MEDLINE on STN
AN 1999451189 MEDLINE
DN 99451189 PubMed ID: 10519944
TI Phase I trial of two recombinant **vaccines** containing the 19kd carboxy terminal fragment of **Plasmodium falciparum merozoite surface protein** 1 (**msp**-1(19)) and T helper epitopes of tetanus toxoid.
AU Keitel W A; Kester K E; Atmar R L; White A C; Bond N H; Holland C A; Krzych U; Palmer D R; Egan A; Diggs C; Ballou W R; Hall B F; Kaslow D
CS Department of Microbiology & Immunology, Baylor College of Medicine, One Baylor Plaza, Houston, TX 77030, USA.. wkeitel@bcm.tmc.edu
NC NO1-AI-25135 (NIAID)
SO VACCINE, (1999 Oct 14) 18 (5-6) 531-9.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT (CLINICAL TRIAL)
(CLINICAL TRIAL, PHASE I)
Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200001
ED Entered STN: 20000124
Last Updated on STN: 20000124
Entered Medline: 20000113
AB The safety and immunogenicity of 2 yeast-derived, blood-stage malaria **vaccines** were evaluated in a phase 1 trial. Healthy adults were given 2 or 3 doses of alum-adsorbed **vaccine** containing the 19 kDa carboxy-terminal fragment of the **merozoite surface protein**-1 (**MSP**-1(19)) derived from the **3D7** or the FVO strain of **Plasmodium falciparum** fused to tetanus toxoid T-helper epitopes P30 and P2. The first 2 doses of **MSP**-1(19) were well tolerated. Hypersensitivity reactions occurred in 3 subjects after the third dose of **MSP**-1(19), including bilateral injection site reactions in 2 (one with generalized skin rash), and probable histamine-associated hypotension in 1. Serum antibody responses to **MSP**-1(19) occurred in 5/16, 9/16 and 0/8 subjects given 20 microg of **MSP**-1(19), 200 microg of **MSP**-1(19), and control **vaccines** (hepatitis B or Td), respectively. Both **MSP**-1(19) **vaccines** were immunogenic in humans, but changes in formulation will be necessary to improve safety and immunogenicity profiles.

L17 ANSWER 8 OF 13 MEDLINE on STN
AN 1999348464 MEDLINE
DN 99348464 PubMed ID: 10417674
TI Antibodies to a **merozoite surface protein** promote multiple invasion of red blood cells by malaria parasites.
AU Ramasamy R; Yasawardena S; Kanagaratnam R; Buratti E; Baralle F E; Ramasamy M S
CS Molecular Biology and Immunology Laboratories, Division of Life Sciences, Institute Fundamental Studies, Kandy, Sri Lanka.
SO PARASITE IMMUNOLOGY, (1999 Aug) 21 (8) 397-407.
Journal code: 7910948. ISSN: 0141-9838.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)

LA English
FS Priority Journals
EM 199909
ED Entered STN: 19991005
Last Updated on STN: 19991005
Entered Medline: 19990917
AB The 40-50 kDa merozoite surface antigen (MSA2) is a candidate molecule for use in a malaria **vaccine**. The gene for MSA2 from the **3D7** isolate of **Plasmodium falciparum** was amplified by polymerase chain reaction and cloned into the bacterial expression vector pGEX-3X to obtain a fusion protein of MSA2 with Schistosoma japonicum glutathione S-transferase. The recombinant fusion protein was used to immunize rabbits. After four injections, the sera had Western blotting and immunofluorescence titres of 10(-6). Immune sera, and immunoglobulin (Ig)G, F(ab)'2, F(ab) prepared from the immune sera, were assessed for their effects on the growth of **3D7** parasites in vitro by microscopy and a [3H]-hypoxanthine incorporation assay. The antibodies did not significantly inhibit red blood cell invasion and parasite growth when added to cultures as 10% v/v serum or as immunoglobulin preparations at concentrations up to 200 microg ml(-1). However, in the presence of IgG or F(ab)'2, but not F(ab), antibodies to MSA2, the proportions of red blood cells invaded by more than one merozoite increased significantly. Multiple invasion is attributed to merozoites cross-linked by bivalent antibodies, attaching to and subsequently invading the same red cell. These observations have a bearing on the evasion of host immune responses by the parasite and the use of full-length recombinant MSA2 protein in a malaria **vaccine**
.

L17 ANSWER 9 OF 13 MEDLINE on STN
AN 1999222525 MEDLINE
DN 99222525 PubMed ID: 10205793
TI Human antibodies to the 19kDa C-terminal fragment of **Plasmodium falciparum merozoite surface protein**
1 inhibit parasite growth in vitro.
AU Egan A F; Burghaus P; Druilhe P; Holder A A; Riley E M
CS Institute of Cell, Animal and Population Biology, University of Edinburgh, Scotland, UK.
SO PARASITE IMMUNOLOGY, (1999 Mar) 21 (3) 133-9.
Journal code: 7910948. ISSN: 0141-9838.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199906
ED Entered STN: 19990714
Last Updated on STN: 19990714
Entered Medline: 19990629
AB The 19kDa, C-terminal fragment of the major surface protein of **Plasmodium falciparum** (PfMSP1(19)) is a candidate for inclusion in a subunit malaria **vaccine**. In this study, we show that PfMSP1(19)-specific antibodies, affinity purified from malaria-immune human serum, can: (i) compete with invasion-inhibitory monoclonal antibodies for binding to PfMSP1(19) and (ii) mediate inhibition of parasite growth in vitro, in the absence of complement and mononuclear cells, at physiological antibody concentrations (100 micrograms/ml). Parasites expressing either the K1 or **3D7** allele of PfMSP1(19) were equally susceptible to inhibition of merozoite invasion, indicating that the target epitopes of inhibitory antibodies are conserved or cross-reactive. These studies suggest that **vaccines** designed to induce antibodies to PfMSP1(19) may protect against the high levels of malaria parasitaemia which are associated with clinical disease.

L17 ANSWER 10 OF 13 MEDLINE on STN
AN 1999254761 MEDLINE
DN 99254761 PubMed ID: 10323182
TI Heritability and segregation analysis of immune responses to specific malaria antigens in Papua New Guinea.
AU Stirnadel H A; Beck H P; Alpers M P; Smith T A
CS Department of Public Health and Epidemiology, Swiss Tropical Institute, Basel.. stirnadel@ubaclu.unibas.ch
SO GENETIC EPIDEMIOLOGY, (1999) 17 (1) 16-34.
Journal code: 8411723. ISSN: 0741-0395.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199906
ED Entered STN: 19990628
Last Updated on STN: 19990628
Entered Medline: 19990615
AB Familial patterns of inheritance of immune responses to specific **Plasmodium falciparum** antigens were studied in 214 adults in an area of Papua New Guinea highly endemic for malaria. Preliminary variance component analysis indicated familial aggregation in both humoral and cellular immune responses against the ring-infected erythrocyte surface antigen (RESA) and the FC27 allele of the Merozoite surface antigen 2 (MSA-2). Including a term for sharing houses in the models affected only the antibody response to RESA. Segregation analysis of the antibody responses against RESA indicated inheritance via a multifactorial model and analysis of the proliferation response suggested a possible recessive major gene. The best fitting models for the immune responses against MSA-2 (FC27) postulated dominant major gene inheritance. We found no significant associations between HLA class I or II alleles and these two antigens in this population. Although there was evidence of familial aggregation of antibody responses to MSA-2 (**3D7**), the segregation analysis failed to identify a mode of inheritance. There was little or no heritability of either humoral or cellular immune responses against the NANP repeats of the Circumsporozoite protein (NANP), the synthetic malaria **vaccine** SPf66, or a preparation of MSA-2 (**3D7**) from which the repetitive part was deleted (MSA-2 (d3D7)). Although it is often difficult to separate genetic effects from the effects of living in the same environment, it appears that some immune responses against certain malaria antigens may be partly influenced by genetic factors.

L17 ANSWER 11 OF 13 MEDLINE on STN
AN 1998084480 MEDLINE
DN 98084480 PubMed ID: 9423864
TI Temporal variation of the **merozoite surface protein**-2 gene of **Plasmodium falciparum**.
AU Eisen D; Billman-Jacobe H; Marshall V F; Fryauff D; Coppel R L
CS Department of Microbiology, Monash University, Clayton, Victoria, Australia.
SO INFECTION AND IMMUNITY, (1998 Jan) 66 (1) 239-46.
Journal code: 0246127. ISSN: 0019-9567.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
OS GENBANK-U72948; GENBANK-U72949; GENBANK-U72950; GENBANK-U72951; GENBANK-U72952; GENBANK-U72953; GENBANK-U72954; GENBANK-U72955; GENBANK-U72956; GENBANK-U72957
EM 199801
ED Entered STN: 19980206
Last Updated on STN: 20000303

Entered Medline: 19980127

AB Extensive polymorphism of key parasite antigens is likely to hamper the effectiveness of subunit **vaccines** against **Plasmodium falciparum** infection. However, little is known about the extent of the antigenic repertoire of naturally circulating strains in different areas where malaria is endemic. To address this question, we conducted a study in which blood samples were collected from parasitemic individuals living within a small hamlet in Western Irian Jaya and subjected to PCR amplification using primers that would allow amplification of the gene encoding **merozoite surface protein**-2 (MSP2). We determined the nucleotide sequence of the amplified product and compared the deduced amino acid sequences to sequences obtained from samples collected in the same hamlet 29 months previously. MSP2 genes belonging to both major allelic families were observed at both time points. In the case of the FC27 MSP2 family, we observed that the majority of individuals were infected by parasites expressing the same form of MSP2. Infections with parasites expressing **3D7** MSP2 family alleles were more heterogeneous. No MSP2 alleles observed at the earlier time point were detectable at the later time point, either for the population as a whole or for individuals who were assayed at both time points. We examined a subset of the infected patients by using blood samples taken between the two major surveys. In no patients could we detect reinfection by a parasite expressing a previously encountered form of MSP2. Our results are consistent with the possibility that infection induces a form of strain-specific immune response against the MSP2 antigen that biases against reinfection by parasites bearing identical forms of MSP2.

L17 ANSWER 12 OF 13 MEDLINE on STN
AN 96418868 MEDLINE
DN 96418868 PubMed ID: 8821653
TI Effect of context and adjuvant on the immunogenicity of recombinant proteins and peptide conjugates derived from the polymorphic malarial surface antigen MSA2.
AU Jones G L; Spencer L; Lord R; Saul A J
CS University of New England, Armidale, NSW, Australia.
SO VACCINE, (1996 Jan) 14 (1) 77-84.
Journal code: 8406899. ISSN: 0264-410X.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199611
ED Entered STN: 19961219
Last Updated on STN: 20000303
Entered Medline: 19961126

AB We have identified a 51 kDa glycosylated myristylated merozoite surface antigen (MSA2) as the target of a number of monoclonal antibodies which inhibit in vitro invasion of the human malarial parasite **Plasmodium falciparum**. This antigen has been shown to exist in a limited number of strain specific forms but despite wide variation in the sequences of the internal repeat regions both N and C terminal elements of the protein are almost totally conserved. Accordingly, we prepared a large number of overlapping peptide constructs and demonstrated that one peptide SNTFINNA (E71) from the N terminus and two peptides, QHGHMHGS (G5) and NTSDSQKE (G12) from the C terminus could, when suitably conjoined to the carrier protein diphtheria toxoid (DT), elicit antibodies reactive with MSA2 from diverse strains of P. falciparum. Here we compare the immunogenicity of these peptide constructs with two recombinant proteins containing the entire amino acid sequence of MSA2 from the FCQ-27/PNG strain (1609) and the **3D7** strain (1623). We have formulated these recombinant and peptide antigens with Freund's adjuvant, Alum and Algammulin. Both recombinant and peptide

antigens elicit high titre antibodies when tested by ELISA against the immunogens themselves. Although both recombinant proteins include the constant region peptide sequences E71, G5 and G12, the extent of ELISA cross reaction between antibody raised against recombinant and peptide antigen or antibody raised against peptide and recombinant antigen is small and sporadic, and depends to an extent on the adjuvant employed. Antisera against both recombinant proteins 1609 and 1623 detected either recombinant on Western blots, as well as detecting native MSA2 in whole protein extracts from both FCQ-27/PNG and **3D7** strains. Antisera against peptide construct E71 recognized recombinant 1609 but not 1623 but recognized the native MSA2 in both strains studied. Antisera against peptide construct G5 showed a similar pattern of recognition but also detected recombinant 1623 on Western blotting. These results emphasize the importance of context and adjuvant on the ability of selected immunogenic epitopes to elicit antibodies appropriately directed against the native antigen.

L17 ANSWER 13 OF 13 MEDLINE on STN
AN 96143617 MEDLINE
DN 96143617 PubMed ID: 8552419
TI Assessment of the role of the humoral response to **Plasmodium falciparum** MSP2 compared to RESA and SPf66 in protecting Papua New Guinean children from clinical malaria.
AU al-Yaman F; Genton B; Anders R; Taraika J; Ginny M; Mellor S; Alpers M P
CS Papua New Guinea Institute of Medical Research, Madang, Papua New Guinea.
SO PARASITE IMMUNOLOGY, (1995 Sep) 17 (9) 493-501.
Journal code: 7910948. ISSN: 0141-9838.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199602
ED Entered STN: 19960306
Last Updated on STN: 20000303
Entered Medline: 19960220
AB The prevalence and concentration of naturally acquired humoral response (IgG) to **merozoite surface protein** 2 (MSP2), RESA, SPf66 and crude schizont extract were measured in a population living in a malaria highly endemic area of Papua New Guinea. A prospective longitudinal study in 0.5-15 year old children was conducted for one year in order to examine the relationship between the humoral response to these antigens and subsequent susceptibility to clinical malaria using a series of clinical definitions. The prevalence and concentration of antibodies to all antigens increased with age. Such correlation with age was most marked for MSP2 recombinant proteins. When age and previous exposure were controlled for, only antibody levels to MSP2 recombinant proteins (**3D7** and d3D7) and to RESA predicted a reduction in incidence rate of episodes of clinical malaria. Our results support the inclusion of the recombinant proteins of the **3D7** allelic family of merozoite surface antigen 2 and RESA into a subunit **vaccine** against malaria.

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ALL L# QUERIES AND ANSWER SETS ARE DELETED AT LOGOFF
LOGOFF? (Y)/N/HOLD:y
STN INTERNATIONAL LOGOFF AT 09:40:52 ON 25 AUG 2003

L11 ANSWER 1 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2003:427004 CAPLUS
DN 139:67488
TI Genetic diversity and antigenic polymorphism in Plasmodium falciparum: Extensive serological cross-reactivity between allelic variants of merozoite surface protein 2
AU Franks, Simon; Baton, Luke; Tetteh, Kevin; Tongren, Eric; Dewin, David; Akanmori, Bartholomew D.; Koram, Kojo A.; Ranford-Cartwright, Lisa; Riley, Eleanor M.
CS Institute of Cell, Animal and Population Biology, University of Edinburgh, Edinburgh, EH9 3JT, UK
SO Infection and Immunity (2003), 71(6), 3485-3495
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 2 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2003:277216 CAPLUS
DN 139:67468
TI Repeat sequences in block 2 of Plasmodium falciparum merozoite surface protein 1 are targets of antibodies associated with protection from malaria
AU Polley, Spencer D.; Tetteh, Kevin K. A.; Cavanagh, David R.; Pearce, Richard J.; Lloyd, Jennifer M.; Bojang, Kalifa A.; Okenu, Daniel M. N.; Greenwood, Brian M.; McBride, Jana S.; Conway, David J.
CS London School of Hygiene and Tropical Medicine, London, WC1E 7HT, UK
SO Infection and Immunity (2003), 71(4), 1833-1842
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 3 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 1
AN 2003:364869 CAPLUS
DN 139:132142
TI Development and pre-clinical analysis of a Plasmodium falciparum Merozoite Surface Protein-142 malaria **vaccine**
AU Angov, Evelina; Aufiero, Barbara M.; Turgeon, Ann Marie; Van Handenhove, Michel; Ockenhouse, Christian F.; Kester, Kent E.; Walsh, Douglas S.; McBride, Jana S.; Dubois, Marie-Claude; Cohen, Joe; Haynes, J. David; Eckels, Kenneth H.; Heppner, D. Gray; Ballou, W. Ripley; Diggs, Carter L.; Lyon, Jeffrey A.
CS WRAIR, Department of Immunology, Silver Spring, MD, 20910, USA
SO Molecular and Biochemical Parasitology (2003), 128(2), 195-204
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier Science B.V.
DT Journal
LA English
RE.CNT 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 4 OF 99 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT/ISI on STN
AN 2003-04163 BIOTECHDS
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of

malaria;
vector-mediated gene transfer and expression in host cell for recombinant **vaccine** and infection therapy
AU PAN W
PA UNIV SECOND MILITARY MEDICAL
PI WO 2002072625 19 Sep 2002
AI WO 2002-CN49 1 Feb 2002
PRAI CN 2001-105292 1 Feb 2001; CN 2001-105292 1 Feb 2001
DT Patent
LA German
OS WPI: 2002-723317 [78]

L11 ANSWER 5 OF 99 IFIPAT COPYRIGHT 2003 IFI on STN DUPLICATE 3
AN 10216310 IFIPAT;IFIUDB;IFICDB
TI MALARIA **VACCINE**
IN Birdsall Berry (GB); Feeney James (GB); Holder Anthony (GB); Morgan William (GB); Syed Shabih (GB); Uthaipibull Chairat (TH)
PA Unassigned Or Assigned To Individual (68000)
PI US 2002160017 A1 20021031
AI US 2001-978756 20011016
PRAI GB 1999-90722 19990420
CA 1999-2271451 19990525
FI US 2002160017 20021031
DT Utility; Patent Application - First Publication
FS CHEMICAL
APPLICATION
CLMN 36
GI 18 Figure(s).
FIG. 1-MSP-1 sequences aligned according to the EGF-like motif consensus. Top sequence: P. falciparum (SWISS-PROT MSP1 PLAFW). Second sequence: P. vivax Belem strain (PIR A45604). Third sequence: human EGF (PDB legf). Fourth sequence: EGF-like domain consensus (Prosite EGF1). Bottom sequence: 14 residue EGF core region used for structure alignment in FIG. 6. Black highlighting indicates conserved residues of the EGF-like domain. Dark shading shows hydrophobic residues at the EGFmodule pair interface in the P. falciparum, and corresponding conserved residues in the P. vivax sequence.
FIG. 2-Sample of multidimensional heteronuclear NOESY experiments showing planes containing NOE connections to the MSP-1 C-terminal fragment Lys35 NH proton. Top: 13C (D4) and 1H(D3) plane from the 4D-(13C)-HMQC-NOESY-(15N)-HSQC experiment, taken at the chemical shift values of Lys35 NH in 15N(D2) and 1H(D1). Bottom: strip from the 3D (15N)-NOESY-HSQC at the 1H chemical shift value of Lys35 NH (vertical axis, D1) taken at the plane of its 15N (D3) value. The horizontal 1H axis is aligned with that of the top spectrum. The weak cross-peaks at 2.72 and 3.01 ppm in the 3D spectrum do not show corresponding cross-peaks in the 4D spectrum because of the lower signal-tonoise ratio in the latter. These peaks have been assigned as the cross-peaks between Lys35 NH and Asn44 H beta 2 (2.72 ppm), and Cys30 H beta 3 and/or Cys41 H beta 2 (3.01 ppm).
FIG. 3-Stereo drawing showing the backbone C, N, Ca atoms of the 32 refined structures in the final ensemble. The domain-1 is on the left (red), with domain-2 on the right (green), and both the N- and C-termini are near the bottom.
FIG. 4-MOLSCRIPT picture of the most representative model of the ensemble, showing the backbone C alpha trace, antiparallel beta -sheet elements, and disulphide bridges (S gamma atoms in yellow). Domain-1, red; Domain-2, green.
FIG. 5-Alignment of typical EGF-like family members with the fitpdb program, using the 14 amino acid "reduced core" consensus (Bersch et al., 1998) (see FIG. 1). The aligned backbone segment in each structure is white. The structures are aligned relative to the most representative structure of the group (factor Xa), with increasing divergence from left

to right. Numbers indicate the rmsd value of the aligned C, N, C alpha atoms. PDB identification codes: factor Xa (crystal structure), 1hcg; Complement C1r component, 1apq (14th model); human EGF, 1egf (11th model); fibrillin-1, domains-32 and -33, 1emn (minimized average structure); transforming growth factoralpha, 2tgf (minimized average structure); MSP-1 domains-1 and -2, this study.

FIG. 6-Backbone ribbon view of fibrillin-1 versus MSP-1 EGF module pair arrangements. Fibrillin-1 (1emn) cyan (domain-32) and magenta (domain-33) (Downing et al., 1996); MSP-1 domain-1 (yellow) and domain-2 (green). Structures were aligned as in FIG. 6 by the core consensus of the N-terminal domain of each pair. The bound Ca2+ ions in the fibrillin-1 structure are shown as magenta spheres.

FIG. 7-Two views, a and b, (rotated 180 degrees about the y-axis) of the electrostatic potential surface of the MSP-1 EGF module pair, calculated with GRASP. Red indicates negative charge, blue indicates positive charge, and white is neutral. The orientation of the views is shown by the adjacent worm diagrams.

FIG. 8-CPK model of the MSP-1 C-terminal fragment, showing the location of some mutations that affect binding of monoclonal antibodies. Domain-I is towards the top and right sides, and domain-2 towards the bottom left.

FIG. 9-Examples of the binding of monoclonal antibodies to GSTMSP-119 detected by Western blotting. The binding of each monoclonal antibody to protein based on the wild type sequence and to proteins containing modified sequences is shown. The monoclonal antibodies are shown across the top. On the left is shown the proteins: WT, wild type sequence; 22, Leu22 to Arg; 26, Glu26 to Ile; 15, Asn15 to Arg; 27, Glu27 to Tyr; 31, Leu31 to Arg; 43, Glu43 to Leu; 27+31+43, Glu27 to Tyr and Leu31 to Arg and Glu43 to Leu; 15+27+31+43, Asn15 to Arg and Glu27 to Tyr and Leu31 to Arg and Glu43 to Leu.

FIG. 10-The binding of monoclonal antibodies to GST-MSP-119 detected by BIAcore analysis. The binding of each monoclonal antibody is normalised to 100% binding to protein based on the wild type sequence and the binding of proteins containing modified sequences is expressed as a percentage of this. WT, wild type sequence; 15, Asn 15 Arg; 26, Glu26 Ile; 27, Glu27 Tyr; 31, Leu31 Arg; 34, Tyr34 Ser; 43 Glu43 Leu.

FIG. 11-The binding of monoclonal antibodies to GST-MSP-119 containing multiple modifications detected by BIAcore analysis. The binding of each monoclonal antibody is normalised to 100% binding to protein based on the wild type sequence and the binding of proteins containing modified sequences is expressed as a percentage of this. WT, wild type sequence; The combinations contain 3 mutations (27+31+43), or 4 mutations ((27+31+34+43) and (15+27+31+43)), at each site the changes are those identified in FIG. 10.

FIG. 12-Identification of blocking antibodies using a competitive binding assay and immobilised wild type GST-MSP-119. The ability of antibodies to compete with the binding of mAbs 12.8 and 12.10 to GST-MSP-119 was measured using BIAcore analysis. Individual antibodies (x-axis) were bound to the antigen and then the amount of either 12.8 or 12.10 (inhibitory mAb) that could subsequently bind was quantified. The amount of binding is presented as a percentage of the total amount of either 12.8 or 12.10 bound in the absence of pre-incubation with another antibody.

FIG. 13-Antibodies induced by immunisation with a modified recombinant MSP-119 assayed for their ability to inhibit secondary processing. Washed 3D7 merozoites were either analysed directly without incubation (0 h) or incubated for 1 hour at 37 degrees C. in the presence of no serum (no serum), 1 mM PMSF as a control for complete inhibition, normal rabbit sera (normal serum), or serum from a rabbit immunised with the 15+27+31+43 modified protein (immune serum), all at 1:10 dilution in reaction buffer. The level of MSP-133 released into the supernatant as a results of secondary processing was measured using an ELISA method and is represented by Absorbance at 492 nmn.

FIG. 14. Pichia pastoris codon preference table used for input to the CODOP program.

FIG. 15. DNA and protein sequences for the optimized synthetic MSP-142 gene. A: Complete sequence designed for optimum codon usage and expression in P. pastoris. B: Sequence of the synthetic MSP-119 construct in the expression vector pPIC9K-HXa. Uppercase letters: vector sequences, including the His6 tag and factor Xa cleavage site (IEGR). Lowercase letters: synthetic MSP-119 coding sequence. The cloned sequence in located at the SnaBI restriction site of the pPIC9K sequence. C: Expressed protein sequence of the synthetic MSP-1 19 construct. The sequence shown is produced as a fusion to the pPIC9K alpha-factor secretion signal, following the kex2/STE13 processing sites. The synthetic MSP-119 is in bold-face type. D: Sequence of the MSP-133 construct. The cloned sequence is located at the SmaI site of the pUC118 vector. E: Predicted protein sequence of the synthetic MSP-133 construct translation product.

FIG. 16. Gene assembly PCR reactions for the MSP-133 and MSP-119 sequences. Reaction 1:10 mu L aliquots of the assembly reactions. Reaction 2:20 mu L aliquots of the amplification reactions. The N-terminal and middle fragments were subsequently spliced together to form the MSP-133 synthetic construct. The C-terminal fragment synthesis reactions produced the optimized MSP-119 construct.

FIG. 17. Expression of the synthetic MSP-119 protein in P. pastoris. Lanes 1-6: trichloroacetic acid precipitates of secreted recombinant protein from culture supernatants, without further purification (5 mu L each). Samples from duplicate cultures of three independent transformants. Lane 8,9: purified, deglycosylated MSP-119 produced from the original P. falciparum sequence. Lane 7,10: NOVEX molecular weight markers.

FIG. 18. A: (1H/15N)-HSQC spectrum of the protein (2.5 mM) expressed from the optimized synthetic MSP-119 gene. B: Control (1H/15N)-HSQC of deglycosylated protein (2.2 mM) expressed from the original P. falciparum sequence (Morgan et al., 1999).

L11 ANSWER 6 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:736281 CAPLUS
DN 137:261873
TI Recombinant Plasmodium vivax merozoite protein p42: Diagnosis and therapy
IN Lanar, David E.; Dutta, Sheetij; Ware, Lisa A.
PA Walter Reed Army Institute of Research, USA
SO PCT Int. Appl., 71 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002074802	A2	20020926	WO 2002-US8307	20020318
	WO 2002074802	A3	20030703		
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	US 2003157650	A1	20030821	US 2002-100699	20020318
PRAI	US 2001-277002P	P	20010319		

L11 ANSWER 7 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:965183 CAPLUS
DN 138:38063

TI Recombinant expression of human malaria pathogen - Plasmodium falciparum merozoite surface protein-1 antigen p42 in transgenic plants
IN Chang, Sandra P.; Christopher, David A.; Vine, Benjamin; Su, Wei-Wen; Bugos, Robert
PA USA
SO U.S. Pat. Appl. Publ., 30 pp., Cont.-in-part of U.S. Ser. No. 500,376.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002194648	A1	20021219	US 2002-98514	20020311
PRAI	US 2000-500376	A2	20000208		
	US 2001-274599P	P	20010309		

L11 ANSWER 8 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:963458 CAPLUS
DN 138:249433
TI Mosaic organization and heterogeneity in frequency of allelic recombination of the Plasmodium vivax merozoite surface protein-1 locus
AU Putaporntip, Chaturong; Jongwutiwes, Somchai; Sakihama, Naoko; Ferreira, Marcelo U.; Kho, Weon-Gyu; Kaneko, Akira; Kanbara, Hiroji; Hattori, Tetsuya; Tanabe, Kazuyuki
CS Laboratory of Biology, Osaka Institute of Technology, Osaka, 535-8585, Japan
SO Proceedings of the National Academy of Sciences of the United States of America (2002), 99(25), 16348-16353
CODEN: PNASA6; ISSN: 0027-8424
PB National Academy of Sciences
DT Journal
LA English
RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 9 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:815715 CAPLUS
DN 137:293240
TI Nature and specificity of the required protective immune response that develops postchallenge in mice vaccinated with the 19-kilodalton fragment of Plasmodium yoelii merozoite surface protein 1
AU Wipasa, Jiraprapa; Xu, Huji; Makobongo, Morris; Gatton, Michelle; Stowers, Anthony; Good, Michael F.
CS Cooperative Research Center for Vaccine Technology, Queensland Institute of Medical Research, Herston, 4029, Australia
SO Infection and Immunity (2002), 70(11), 6013-6020
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 10 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:298599 CAPLUS
DN 137:44140
TI Truncation of merozoite surface protein 3 disrupts its trafficking and that of acidic-basic repeat protein to the surface of Plasmodium falciparum merozoites
AU Mills, Kerry E.; Pearce, J. Andrew; Crabb, Brendan S.; Cowman, Alan F.
CS The Walter and Eliza Hall Institute of Medical Research, Melbourne, 3050, Australia

SO Molecular Microbiology (2002), 43(6), 1401-1411
CODEN: MOMIEE; ISSN: 0950-382X
PB Blackwell Publishing Ltd.
DT Journal
LA English
RE.CNT 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 11 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 4
AN 2002:87811 CAPLUS
DN 136:246020
TI Protective immune responses to the 42-kilodalton (kDa) region of Plasmodium yoelii merozoite surface protein 1 are induced by the C-terminal 19-kDa region but not by the adjacent 33-kDa region
AU Ahlborg, Niklas; Ling, Irene T.; Howard, Wendy; Holder, Anthony A.; Riley, Eleanor M.
CS Institute of Cell, Animal and Population Biology, Edinburgh University, Edinburgh, EH9 3JT, UK
SO Infection and Immunity (2002), 70(2), 820-825
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 12 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2003:279194 CAPLUS
DN 138:352452
TI Specificities of antibodies to Plasmodium falciparum merozoite surface protein (MSP)-119
AU Nwuba, R. I.; Adoro, S. A.; Anumudu, C. I.; Odaibo, A. B.; Omosun, Y.; Holder, A. A.; Nwagwu, M.
CS Cellular Parasitology Programme, Department of Zoology, University of Ibadan, Ibadan, Nigeria
SO Parasitology--ICOPA X: Symposia, Workshops and Contributed Papers, Proceedings of the International Congress, 10th, Vancouver, BC, Canada, Aug. 4-9, 2002 (2002), 477-486 Publisher: Monduzzi Editore, Bologna, Italy.
CODEN: 69DTB8; ISBN: 88-323-2804-6
DT Conference
LA English
RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 13 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 5
AN 2002:181617 CAPLUS
DN 137:44057
TI The Plasmodium vivax homologues of merozoite surface proteins 4 and 5 from Plasmodium falciparum are expressed at different locations in the merozoite
AU Black, Casilda G.; Barnwell, John W.; Huber, Curtis S.; Galinski, Mary R.; Coppel, Ross L.
CS Department of Microbiology, Monash University, Calyton, 3800, Australia
SO Molecular and Biochemical Parasitology (2002), 120(2), 215-224
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier Science Ireland Ltd.
DT Journal
LA English
RE.CNT 57 THERE ARE 57 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 14 OF 99 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
AN 2002:236311 BIOSIS
DN PREV200200236311
TI Merozoite surface protein-9 of Plasmodium vivax and related simian malaria parasites is orthologous to p101/ABRA of P. falciparum.
AU Vargas-Serrato, Esmeralda; Barnwell, John W.; Ingravallo, Paul; Perler, Francine B.; Galinski, Mary R. (1)
CS (1) Department of Medicine, Emory Vaccine Research Center, Yerkes Primate Research Center, Emory University, 954 Gatewood Rd., Atlanta, GA, 30329: galinski@rmy.emory.edu USA
SO Molecular & Biochemical Parasitology, (March, 2002) Vol. 120, No. 1, pp. 41-52. print.
ISSN: 0166-6851.
DT Article
LA English

L11 ANSWER 15 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:473700 CAPLUS
DN 135:209568
TI Naturally acquired antibody responses to Plasmodium falciparum merozoite surface protein 4 in a population living in an area of endemicity in Vietnam
AU Wang, Lina; Richie, Thomas L.; Stowers, Anthony; Nhan, Doan Hanh; Coppel, Ross L.
CS Department of Microbiology, Monash University, Clayton, 3800, Australia
SO Infection and Immunity (2001), 69(7), 4390-4397
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 16 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:215868 CAPLUS
DN 134:309752
TI Efficacy of two alternate **vaccines** based on Plasmodium falciparum merozoite surface protein 1 in an Aotus challenge trial
AU Stowers, Anthony W.; Cioce, Vittoria; Shimp, Richard L.; Lawson, Mark; Hui, George; Muratova, Olga; Kaslow, David C.; Robinson, Robin; Long, Carole A.; Miller, Louis H.
CS Malaria Vaccine Development Unit, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Rockville, MD, USA
SO Infection and Immunity (2001), 69(3), 1536-1546
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 17 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:855406 CAPLUS
DN 136:230847
TI High-Level Production and Purification of P30P2MSP119, an Important **Vaccine** Antigen for Malaria, Expressed in the Methylotropic Yeast Pichia pastoris
AU Brady, Ciaran P.; Shimp, Richard L.; Miles, Aaron P.; Whitmore, Michael; Stowers, Anthony W.
CS Malaria Vaccine Development Unit, Laboratory of Parasitic Diseases, National Institutes of Allergy and Infectious Diseases, National Institutes of Health, Rockville, MD, 20852, USA

SO Protein Expression and Purification (2001), 23(3), 468-475
CODEN: PEXPEJ; ISSN: 1046-5928
PB Academic Press
DT Journal
LA English
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 18 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:567132 CAPLUS
DN 136:304762
TI Sequence diversity and linkage disequilibrium within the merozoite surface protein-1 (Msp-1) locus of Plasmodium falciparum: a longitudinal study in Brazil
AU Da Silveira, Lucimeire A.; Ribeiro, Weber L.; Kirchgatter, Karin; Wunderlich, Gerhard; Matsuoka, Hiroyuki; Tanabe, Kazuyuki; Ferreira, Marcelo U.
CS Department of Parasitology, Institute for Biomedical Sciences, University of Sao Paulo, Sao Paulo, 05508-900, Brazil
SO Journal of Eukaryotic Microbiology (2001), 48(4), 433-439
CODEN: JEMIED; ISSN: 1066-5234
PB Society of Protozoologists
DT Journal
LA English
RE.CNT 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 19 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 6
AN 2001:389935 CAPLUS
DN 135:208010
TI Merozoite surface protein 8 of Plasmodium falciparum contains two epidermal growth factor-like domains
AU Black, C. G.; Wu, T.; Wang, L.; Hibbs, A. R.; Coppel, R. L.
CS Department of Microbiology, Monash University, Victoria, 3800, Australia
SO Molecular and Biochemical Parasitology (2001), 114(2), 217-226
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier Science Ireland Ltd.
DT Journal
LA English
RE.CNT 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 20 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:105812 CAPLUS
DN 134:264845
TI Low CD4+ T cell responses to the C-terminal region of the malaria merozoite surface protein-1 may be attributed to processing within distinct MHC class II pathways
AU Quin, Stuart J.; Seixas, Elsa M. G.; Cross, Caroline A.; Berg, Matthias; Lindo, Vivian; Stockinger, Brigitta; Langhorne, Jean
CS National Institute for Medical Research, London, UK
SO European Journal of Immunology (2001), 31(1), 72-81
CODEN: EJIMAF; ISSN: 0014-2980
PB Wiley-VCH Verlag GmbH
DT Journal
LA English
RE.CNT 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 21 OF 99 PROMT COPYRIGHT 2003 Gale Group on STN

ACCESSION NUMBER: 2000:1063828 PROMT

TITLE: EUROPEAN PATENT DISCLOSURES.
SOURCE: BIOWORLD Today, (7 Dec 2000) Vol. 11, No. 236.
PUBLISHER: American Health Consultants, Inc.
DOCUMENT TYPE: Newsletter
LANGUAGE: English
WORD COUNT: 1952
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L11 ANSWER 22 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 7
AN 2000:756742 CAPLUS
DN 133:334041
TI **Vaccine**
IN Holder, Anthony; Birdsall, Berry; Feeney, James; Morgan, William; Syed, Shabih; Uthaipibull, Chairat
PA Medical Research Council, UK
SO PCT Int. Appl., 126 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000063245	A2	20001026	WO 2000-GB1558	20000420
	WO 2000063245	A3	20010503		
	WO 2000063245	C2	20020829		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	CA 2271451	AA	20001020	CA 2000-2271451	19990525
	EP 1180120	A2	20020220	EP 2000-920918	20000420
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	BR 2000009823	A	20020409	BR 2000-9823	20000420
	JP 2002543774	T2	20021224	JP 2000-612331	20000420
	US 2002160017	A1	20021031	US 2001-978756	20011016
PRAI	GB 1999-9072	A	19990420		
	US 1999-311817	A	19990513		
	CA 1999-2271451	A	19990525		
	WO 2000-GB1558	W	20000420		

L11 ANSWER 23 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 8
AN 2000:685462 CAPLUS
DN 133:333670
TI Immunization with recombinant Plasmodium yoelii merozoite surface protein 4/5 protects mice against lethal challenge
AU Kedzierski, Lukasz; Black, Casilda G.; Coppel, Ross L.
CS Department of Microbiology, Monash University, Victoria, 3800, Australia
SO Infection and Immunity (2000), 68(10), 6034-6037
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 24 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:282557 CAPLUS
DN 133:41848
TI Characterization of conserved T- and B-cell epitopes in Plasmodium falciparum major merozoite surface protein
AU Parra, Marcela; Hui, George; Johnson, Armead H.; Berzofsky, Jay A.; Roberts, Theodore; Quakyi, Isabella A.; Taylor, Diane W.
CS Department of Biology, Georgetown University, Washington, DC, 20057, USA
SO Infection and Immunity (2000), 68(5), 2685-2691
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 25 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2000:435281 CAPLUS
DN 134:84824
TI Anti-merozoite surface protein-1 19-kDa IgG in mother-infant pairs naturally exposed to Plasmodium falciparum: subclass analysis with age, exposure to asexual parasitemia, and protection against malaria. V. The Asembo Bay Cohort Project
AU Branch, OraLee H.; Oloo, Aggrey J.; Nahlen, Bernard L.; Kaslow, David; Lal, Altaf A.
CS Division of Parasitic Diseases, Emory University, Atlanta, GA, USA
SO Journal of Infectious Diseases (2000), 181(5), 1746-1752
CODEN: JIDIAQ; ISSN: 0022-1899
PB University of Chicago Press
DT Journal
LA English
RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 26 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:27566 CAPLUS
DN 135:206058
TI Production of the major merozoite surface protein 1 (MSP1) of Plasmodium falciparum in Pichia pastoris
AU Zhang, Dong-mei; Pan, Wei-qing; Lu, De-ru
CS Department of Aetiologic Biology, Second Military Medical University, Shanghai, 200433, Peop. Rep. China
SO Shengwu Gongcheng Xuebao (2000), 16(6), 723-726
CODEN: SGXUED; ISSN: 1000-3061
PB Kexue Chubanshe
DT Journal
LA Chinese

L11 ANSWER 27 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:13659 CAPLUS
DN 134:217885
TI Temporal and spatial distribution of the variants of merozoite surface protein-1 (MSP-1) in Plasmodium falciparum populations in Brazil
AU Silva, N. S.; Silveira, L. A.; Machado, R. L. D.; Povoa, M. M.; Ferreira, M. U.
CS Laboratorio de Parasitologia Molecular, Departamento de Doencas Infecciosas e Parasitarias, Faculdade de Medicina e Enfermagem de Sao fose do Rio Preto, Sao fose do Rio Preto, Brazil
SO Annals of Tropical Medicine & Parasitology (2000), 94(7), 675-688
CODEN: ATMPA2; ISSN: 0003-4983
PB Carfax Publishing
DT Journal
LA English

RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 28 OF 99 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
AN 2001:13399 BIOSIS
DN PREV200100013399
TI Hypervariability in a leading Plasmodium vivax malaria **vaccine** candidate, C-terminal Merozoite Surface Protein 1.
AU Manamperi, A. (1); Holm, I.; Perera, L.; Handunnetti, S. M.; Longacre, S.
CS (1) Departement d'Immunologie, Institut Pasteur, Paris France
SO American Journal of Tropical Medicine and Hygiene, (March, 2000) Vol. 62, No. 3 Supplement, pp. 389. print.
Meeting Info.: 49th Annual Meeting of the American Society of Tropical Medicine and Hygiene Houston, Texas, USA October 29-November 02, 2000 American Society of Tropical Medicine and Hygiene
. ISSN: 0002-9637.
DT Conference
LA English
SL English

L11 ANSWER 29 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2000:481778 CAPLUS
DN 134:114469
TI Biochemical and immunological properties of a viral hybrid particle expressing the Plasmodium vivax merozoite surface protein 1 C-terminal region
AU Wunderlich, Gerhard; del Portillo, Hernando A.
CS Departamento de Parasitologia, Instituto Ciencias Biomedicas II, Universidade de Sao Paulo, Sao Paulo, Brazil
SO Molecular Medicine (New York) (2000), 6(3), 238-245
CODEN: MOMEF3; ISSN: 1076-1551
PB Johns Hopkins University Press
DT Journal
LA English
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 30 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2000:605485 CAPLUS
DN 135:56684
TI Plasmodium vivax: Polymorphism in the Merozoite Surface Protein 1 Gene from Wild Colombian Isolates
AU Gutierrez, Arturo; Vicini, Javier; Patarroyo, Manuel Elkin; Murillo, Luis Angel; Patarroyo, Manuel Alfonso
CS Instituto de Immunologia, Hospital San Juan de Dio, Universidad Nacional de Columbia, Santafe de Bogota D.C., Colombia
SO Experimental Parasitology (2000), 95(3), 215-219
CODEN: EXPAAA; ISSN: 0014-4894
PB Academic Press
DT Journal
LA English
RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 31 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 9
AN 2000:430973 CAPLUS
DN 134:69982
TI Recombinant chimeric proteins generated from conserved regions of Plasmodium falciparum merozoite surface protein 2 generate antiparasite humoral responses in mice
AU Lawrence, Nicole; Stowers, Anthony; Mann, Victoria; Taylor, Darrin; Saul, Allan

CS Australian Centre for International, The University of Queensland, 4029, Australia
SO Parasite Immunology (2000), 22(5), 211-221
CODEN: PAIMD8; ISSN: 0141-9838
PB Blackwell Science Ltd.
DT Journal
LA English
RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 32 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2000:304108 CAPLUS
DN 133:118652
TI Identification of a novel antigenic domain of Plasmodium falciparum merozoite surface protein-1 that specifically binds to human erythrocytes and inhibits parasite invasion, in vitro
AU Nikodem, D.-P.; Davidson, E.-A.
CS Department of Biochemistry and Molecular Biology, Georgetown University Medical Center, Washington, DC, USA
SO Molecular and Biochemical Parasitology (2000), 108(1), 79-91
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier Science Ireland Ltd.
DT Journal
LA English
RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 33 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:762287 CAPLUS
DN 132:205195
TI Sequence diversity of the merozoite surface protein 1 of Plasmodium falciparum in clinical isolates from the Kilombero District, Tanzania
AU Jiang, G.; Daubenberger, C.; Huber, W.; Matile, H.; Tanner, M.; Pluschke, G.
CS Swiss Tropical Institute, Basel, CH-4002, Switz.
SO Acta Tropica (2000), 74(1), 51-61
CODEN: ACTRAQ; ISSN: 0001-706X
PB Elsevier Science Ireland Ltd.
DT Journal
LA English
RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 34 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 10
AN 2001:838210 CAPLUS
DN 136:33666
TI Identification of a conformational epitope in the carboxylic end of the MSP-1 protein of Plasmodium falciparum
AU Calvo, Julio C.; Satterthwait, Arnold C.
CS Instituto de Inmunologia, Hospital San Juan de Dios, Universidad Nacional de Colombia, Bogota, Colombia
SO Revista Colombiana de Quimica (2000), 29(2), 15-23
CODEN: RCLQAY; ISSN: 0120-2804
PB Universidad Nacional de Colombia, Departamento de Quimica
DT Journal
LA Spanish
RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 35 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:286097 CAPLUS
DN 130:307534

TI Novel modified MSP-1 nucleic acid sequences and methods for increasing mRNA levels and protein expression in cell systems
IN Chen, Li How; Meade, Harry
PA Genzyme Transgenics Corporation, USA
SO PCT Int. Appl., 34 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9920774	A2	19990429	WO 1998-US22226	19981020
	WO 9920774	A3	19990826		
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	AU 9911088	A1	19990510	AU 1999-11088	19981020
	AU 760231	B2	20030508		
	EP 1025244	A2	20000809	EP 1998-953813	19981020
	R: AT, BE, CH, DE, DK, ES, FR, GB, IT, LI, NL, SE, IE				
	BR 9813110	A	20000815	BR 1998-13110	19981020
	JP 2001520048	T2	20011030	JP 2000-517094	19981020
	US 6593463	B1	20030715	US 1998-175684	19981020
	CA 2306796	AA	19990429	CA 1998-2306796	19981028
	US 2002144299	A1	20021003	US 2002-82018	20020220
PRAI	US 1997-62592P	P	19971020		
	US 1998-85649P	P	19980515		
	US 1998-175684	A1	19981020		
	WO 1998-US22226	W	19981020		

L11 ANSWER 36 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:291168 CAPLUS
DN 131:72476
TI Levels of antibody to conserved parts of Plasmodium falciparum merozoite surface protein 1 in Ghanaian children are not associated with protection from clinical malaria
AU Dodoo, Daniel; Theander, Thor G.; Kurtzhals, Jorgen A. L.; Koram, Kojo; Riley, Eleanor; Akanmori, Bartholomew D.; Nkrumah, Francis K.; Hviid, Lars
CS Noguchi Memorial Institute for Medical Research, University of Ghana, Legon, Ghana
SO Infection and Immunity (1999), 67(5), 2131-2137
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 37 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:775353 CAPLUS
DN 132:249696
TI Phase I trial of two recombinant **vaccines** containing the 19kd carboxy terminal fragment of Plasmodium falciparum merozoite surface protein 1 (msp-119) and T helper epitopes of tetanus toxoid
AU Keitel, W. A.; Kester, K. E.; Atmar, R. L.; White, A. C., Jr.; Bond, N. H.; Holland, C. A.; Krzych, U.; Palmer, D. R.; Egan, A.; Diggs, C.; Ballou, W. R.; Hall, B. F.; Kaslow, D.

CS Department of Microbiology & Immunology, Baylor College of Medicine, Houston, TX, 77030, USA
SO Vaccine (1999), 18(5-6), 531-539
CODEN: VACCDE; ISSN: 0264-410X
PB Elsevier Science Ltd.
DT Journal
LA English
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 38 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 11
AN 1999:239748 CAPLUS
DN 131:72398
TI Testing the efficacy of a recombinant merozoite surface protein (MSP-119) of Plasmodium vivax in Saimiri boliviensis monkeys
AU Collins, William E.; Kaslow, David C.; Sullivan, Joann S.; Morris, Carla L.; Galland, G. Gale; Yang, Chunfu; Saekhou, Ae M.; Xiao, Lihua; Lal, Altaf A.
CS Division of Parasitic Diseases and Scientific Resources Program, Centers for Disease Control and Prevention, National Center for Infectious Diseases, Atlanta, GA, USA
SO American Journal of Tropical Medicine and Hygiene (1999), 60(3), 350-356
CODEN: AJTHAB; ISSN: 0002-9637
PB American Society of Tropical Medicine and Hygiene
DT Journal
LA English
RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 39 OF 99 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 12
AN 1999:60337 CABA
DN 990802999
TI Plasmodium vivax, P. cynomolgi, and P. knowlesi: identification of homologue proteins associated with the surface of merozoites
AU Barnwell, J. W.; Galinski, M. R.; DeSimone, S. G.; Perler, F.; Ingravallo, P.
CS Department of Medical and Molecular Parasitology, New York University School of Medicine, 341 East 25th Street, New York, NY 10010, USA.
SO Experimental Parasitology, (1999) Vol. 91, No. 3, pp. 238-249. 62 ref.
ISSN: 0014-4894
DT Journal
LA English

L11 ANSWER 40 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 13
AN 1999:63392 CAPLUS
DN 130:250884
TI Expression of disulfide-bridge-dependent conformational epitopes and immunogenicity of the carboxy-terminal 19 kDa domain of Plasmodium yoelii merozoite surface protein-1 in live attenuated Salmonella **vaccine** strains
AU Somner, Elizabeth A.; Ogun, Solabomi A.; Sinha, Katharine A.; Valero, Lilian M. Spencer; Lee, Jeong Jin; Harrison, Julia A.; Holder, Anthony A.; Hormaeche, Carlos E.; Khan, C. M. Anjam
CS Department of Microbiology, The Medical School, University of Newcastle, Newcastle upon Tyne, NE2 4HH, UK
SO Microbiology (Reading, United Kingdom) (1999), 145(1), 221-229
CODEN: MROBEO; ISSN: 1350-0872
PB Society for General Microbiology
DT Journal
LA English
RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 41 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:383809 CAPLUS
DN 131:169030
TI Secretion of parasite-specific immunoglobulin G by purified blood B lymphocytes from immune individuals after in vitro stimulation with recombinant Plasmodium falciparum merozoite surface protein-119 antigen
AU Garraud, O.; Diouf, A.; Holm, I.; Nguer, C. M.; Spiegel, A.; Perraut, R.; Longacre, S.
CS Unite d'Immunologie, Institut Pasteur de Dakar, Senegal
SO Immunology (1999), 97(2), 204-210
CODEN: IMMUAM; ISSN: 0019-2805
PB Blackwell Science Ltd.
DT Journal
LA English
RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 42 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:517833 CAPLUS
DN 132:48693
TI Human antibodies to the 19 kDa C-terminal fragment of Plasmodium falciparum merozoite surface protein 1 inhibit parasite growth in vitro
AU Egan, Andrea F.; Burghaus, Petra; Druilhe, Pierre; Holder, Anthony A.; Riley, Eleanor M.
CS Institute of Cell, Animal and Population Biology, Division of Biological Sciences, University of Edinburgh, UK
SO Parasite Immunology (1999), 21(3), 133-139
CODEN: PAIMD8; ISSN: 0141-9838
PB Blackwell Science Ltd.
DT Journal
LA English
RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 43 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 14
AN 1999:46184 CAPLUS
DN 130:310380
TI Antibody response to the N and C-terminal regions of the Plasmodium vivax Merozoite Surface Protein 1 in individuals living in an area of exclusive transmission of P. vivax malaria in the north of Brazil
AU Soares, Irene S.; Oliveira, Salma G.; Souza, Jose M.; Rodrigues, Mauricio M.
CS Centro de Ciencias Biologicas, Departamento de Patologia, Universidade Federal do Para, Belem, 66075-900, Brazil
SO Acta Tropica (1999), 72(1), 13-24
CODEN: ACTRAQ; ISSN: 0001-706X
PB Elsevier Science Ireland Ltd.
DT Journal
LA English
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 44 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:297903 CAPLUS
DN 131:167426
TI Plasmodium falciparum: variations in the C-terminal cysteine-rich region of the merozoite surface protein-1 in field samples among Indian isolates
AU Lalitha, P. V.; Malhotra, Pawan; Chattopadhyay, Rana; Chauhan, V. S.
CS International Centre for Genetic Engineering and Biotechnology, New Delhi, 110067, India
SO Experimental Parasitology (1999), 92(1), 12-18

CODEN: EXPAAA; ISSN: 0014-4894
PB Academic Press
DT Journal
LA English
RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 45 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:711541 CAPLUS
DN 130:80083
TI Pathways for potentiation of immunogenicity during adjuvant-assisted immunizations with Plasmodium falciparum major merozoite surface protein 1
AU Hui, George S. N.; Hashimoto, Caryn N.
CS Department of Tropical Medicine, University of Hawaii, Honolulu, HI, 96816, USA
SO Infection and Immunity (1998), 66(11), 5329-5336
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 46 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:85926 CAPLUS
DN 130:279132
TI Allelic diversity in the merozoite surface protein-1 and epidemiology of multiple-clone Plasmodium falciparum infections in northern Tanzania
AU Ferreira, M. U.; Liu, Q.; Kimura, M.; Ndawi, B. T.; Tanabe, K.; Kawamoto, F.
CS Department of International Health, Nagoya University School of Medicine, Nagoya, Japan
SO Journal of Parasitology (1998), 84(6), 1286-1289
CODEN: JOPAA2; ISSN: 0022-3395
PB American Society of Parasitologists
DT Journal
LA English
RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 47 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 15
AN 1998:408343 CAPLUS
DN 129:147852
TI A longitudinal study of type-specific antibody responses to Plasmodium falciparum merozoite surface protein-1 in an area of unstable malaria in Sudan
AU Cavanagh, David R.; Elhassan, Ibrahim M.; Roper, Cally; Robinson, V. Jane; Giha, Haider; Holder, Anthony A.; Hviid, Lars; Theander, Thor G.; Arnot, David E.; McBride, Jana S.
CS Division of Biological Sciences, Inst. of Cell, Animal and Population Biology, Univ. of Edinburgh, Edinburgh, UK
SO Journal of Immunology (1998), 161(1), 347-359
CODEN: JOIMA3; ISSN: 0022-1767
PB American Association of Immunologists
DT Journal
LA English
RE.CNT 57 THERE ARE 57 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 48 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:285209 CAPLUS
DN 129:78992

TI Predicted and observed alleles of Plasmodium falciparum merozoite surface protein-1 (MSP-1), a potential malaria **vaccine** antigen
AU Qari, Shoukat H.; Shi, Ya-Ping; Goldman, Ira F.; Nahlen, Bernard L.; Tibayrenc, Michel; Lal, Altaf A.
CS National Center for Infectious Diseases, Division of Parasitic Diseases, Centers for Disease Control and Prevention (CDC), Atlanta, GA, 303412, USA
SO Molecular and Biochemical Parasitology (1998), 92(2), 241-252
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier Science B.V.
DT Journal
LA English
RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 49 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:458486 CAPLUS
DN 129:226279
TI Construction of a couple of eukaryotic expression recombinants containing the gene fragment of 42kD C-terminal region of Plasmodium falciparum merozoite surface protein 1
AU Miao, Jun; Xue, Caifang; Yu, Qigui
CS Department of Parasitology, Fourth Military Medical University, Xi'an, 710032, Peop. Rep. China
SO Zhonghua Weishengwuxue He Mianyixue Zazhi (1998), 18(3), 186-188
CODEN: ZWMZDP; ISSN: 0254-5101
PB Weishenbu Beijing Shengwu Zhipin Yanjiuso
DT Journal
LA Chinese

L11 ANSWER 50 OF 99 PROMT COPYRIGHT 2003 Gale Group on STN

ACCESSION NUMBER: 1998:8828 PROMT
TITLE: Malaria **Vaccines** Responses to Different MSP-1 Variants May Explain Natural Immunity
SOURCE: Vaccine Weekly, (22 Dec 1997) pp. N/A.
ISSN: 1074-2921.
LANGUAGE: English
WORD COUNT: 533
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L11 ANSWER 51 OF 99 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1997-425034 [39] WPIDS
DNN N1997-354015 DNC C1997-136077
TI Recombinant protein containing **Plasmodium merozoite surface protein**-1 p42 fragment - useful in antimalarial **vaccines**, also new antibodies for diagnosis and protein purification.
DC B04 C06 D16 S03
IN BARNWELL, J W; LONGACRE-ANDRE, S; MENDIS, K; NATO, F; ROTH, C; LONGACRE, A S; LONGACREANDRE, S
PA (INSP) INST PASTEUR; (UYNY) UNIV NEW YORK STATE; (UYNY) UNIV NEW YORK MEDICAL CENT
CYC 25
PI WO 9730159 A2 19970821 (199739)* FR 79p C12N015-30
RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: AU CA CN JP KP US
FR 2744723 A1 19970814 (199740) 49p C07K014-445
AU 9718842 A 19970902 (199751) C12N015-30
WO 9730159 A3 19971231 (199817) C12N015-30
EP 880589 A2 19981202 (199901) FR C12N015-30
R: AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
JP 2000506381 W 20000530 (200033) 94p C12N015-09

KR 2000065265 A 20001106 (200128) C12N015-30
ADT WO 9730159 A2 WO 1997-FR291 19970214; FR 2744723 A1 FR 1996-1821 19960214; AU 9718842 A AU 1997-18842 19970214; WO 9730159 A3 WO 1997-FR291 19970214; EP 880589 A2 EP 1997-905213 19970214, WO 1997-FR291 19970214; JP 2000506381 W JP 1997-529058 19970214, WO 1997-FR291 19970214; KR 2000065265 A WO 1997-FR291 19970214, KR 1998-711022 19980814
FDT AU 9718842 A Based on WO 9730159; EP 880589 A2 Based on WO 9730159; JP 2000506381 W Based on WO 9730159
PRAI FR 1996-1821 19960214
IC ICM C07K014-445; C12N015-09; C12N015-30
ICS A61K039-015; A61P033-06; C07K016-20; C12N005-10; C12N005-12; C12N005-24; C12N015-02; C12N015-85; C12N015-86; G01N033-53; G01N033-543; G01N033-569
ICA C12P021-08

L11 ANSWER 52 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 16
AN 1997:730326 CAPLUS
DN 128:21566
TI Immunization with a recombinant C-terminal fragment of Plasmodium yoelii merozoite surface protein 1 protects mice against homologous but not heterologous P. yoelii sporozoite challenge
AU Renia, Laurent; Ling, Irene T.; Marussig, Myriam; Miltgen, Francois; Holder, Anthony A.; Mazier, Dominique
CS CHU Pitie-Salpetriere, Paris, Fr.
SO Infection and Immunity (1997), 65(11), 4419-4423
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 53 OF 99 CABA COPYRIGHT 2003 CABI on STN
AN 1998:67584 CABA
DN 980802773
TI Comparison of protection induced by immunization with recombinant proteins from different regions of merozoite surface protein 1 of Plasmodium yoelii
AU Tian JingHui; Sanjai Kumar; Kaslow, D. C.; Miller, L. H.; Tian, J. H.; Kumar, S.
CS Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, 9000 Rockville Pike, Bethesda, Maryland 20892, USA.
SO Infection and Immunity, (1997) Vol. 65, No. 8, pp. 3032-3036. 18 ref.
ISSN: 0019-9567
DT Journal
LA English

L11 ANSWER 54 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:306951 CAPLUS
DN 127:3998
TI Acquired immune responses to the N- and C-terminal regions of Plasmodium vivax merozoite surface protein 1 in individuals exposed to malaria
AU Soares, Irene S.; Levitus, Gabriela; Souza, Jose M.; Del Portillo, Hernando A.; Rodrigues, Mauricio M.
CS Departamento de Patologia, Centro de Ciencias Biologicas, Universidade Federal do Para, Belem, 66075-900, Brazil
SO Infection and Immunity (1997), 65(5), 1606-1614
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English

L11 ANSWER 55 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 17
AN 1997:696379 CAPLUS
DN 127:330059
TI Immunization against the murine malaria parasite Plasmodium yoelii using a recombinant protein with adjuvants developed for clinical use
AU Ling, I. T.; Ogun, S. A.; Momin, P.; Richards, R. L.; Garcon, N.; Cohen, J.; Ballou, W. R.; Holder, A. A.
CS National Institute for Medical Research, London, NW7 1AA, UK
SO Vaccine (1997), 15(14), 1562-1567
CODEN: VACCDE; ISSN: 0264-410X
PB Elsevier
DT Journal
LA English

L11 ANSWER 56 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:277416 CAPLUS
DN 126:316049
TI Antigenicity of recombinant proteins derived from Plasmodium falciparum merozoite surface protein 1
AU Cavanagh, David R.; McBride, Jana S.
CS Institute Cell Animal Population Biology, Division Biological Sciences, University Edinburgh, Edinburgh, EH9 3JT, UK
SO Molecular and Biochemical Parasitology (1997), 85(2), 197-211
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier
DT Journal
LA English

L11 ANSWER 57 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:536230 CAPLUS
DN 125:192945
TI Immunization of Aotus nancymai with recombinant C terminus of Plasmodium falciparum merozoite surface protein 1 in liposomes and alum adjuvant does not induce protection against a challenge infection
AU Burghaus, Petra A.; Wellde, Bruce T.; Hall, Ted; Richards, Roberta L.; Egan, Andrea F.; Riley, Eleanor M.; Ballou, W. Ripley; Holder, Anthony A.
CS National Inst. Medical Res., Univ. Edinburgh, Edinburgh, UK
SO Infection and Immunity (1996), 64(9), 3614-3619
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English

L11 ANSWER 58 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:391999 CAPLUS
DN 125:55751
TI Natural immune response to the C-terminal 19-kilodalton domain of Plasmodium falciparum merozoite surface protein 1
AU Shi, Ya Ping; Sayed, Umar; Qari, Shoukat H.; Roberts, Jacquelin M.; Udhayakumar, Venkatachalam; Oloo, Aggrey J.; Hawley, William A.; Kaslow, David C.; Nahlen, Bernard L.; Lal, Altaf A.
CS Div. Parasitic Diseases, Center for Disease Control Prevention, Atlanta, GA, 30341, USA
SO Infection and Immunity (1996), 64(7), 2716-2723
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English

L11 ANSWER 59 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:759700 CAPLUS
DN 126:30098

TI Reproducing the immune response against the Plasmodium vivax merozoite surface protein 1 with mimotopes selected from a phage-displayed peptide library
AU Demangel, C.; Lafaye, P.; Mazie, J. C.
CS Lab. d'Hybridolab, Inst. Pasteur, Paris, Fr.
SO Molecular Immunology (1996), 33(11/12), 909-916
CODEN: MOIMD5; ISSN: 0161-5890
PB Elsevier
DT Journal
LA English

L11 ANSWER 60 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:103557 CAPLUS
DN 126:183573
TI Sequence studies on the COOH-terminal region of the merozoite surface protein-1 in field samples of Plasmodium falciparum from diverse geographic areas
AU Kang, Yang; Long, Carole A.
CS Dep. Microbiol. Immunol., Medical College of Pennsylvania and Hahnemann University, Philadelphia, PA, 19102, USA
SO Annals of the New York Academy of Sciences (1996), 797(Microbial Pathogenesis and Immune Response II), 282-284
CODEN: ANYAA9; ISSN: 0077-8923
PB New York Academy of Sciences
DT Journal
LA English

L11 ANSWER 61 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:904933 CAPLUS
DN 123:311927
TI Human antibody response to Plasmodium falciparum merozoite surface protein 2 is serogroup specific and predominantly of the immunoglobulin G3 subclass
AU Taylor, Rachel R.; Smith, Donald B.; Robinson, V. Jane; McBride, Jana S.; Riley, Eleanor M.
CS Institute of Cell, Univ. of Edinburgh, Edinburgh, EH9 3JT, UK
SO Infection and Immunity (1995), 63(11), 4382-8
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English

L11 ANSWER 62 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:965199 CAPLUS
DN 124:108069
TI The Plasmodium cynomolgi merozoite surface protein 1 C-terminal sequence and its homologies with other Plasmodium species
AU Longacre, Shirley
CS Unite d'Immunoparasitologie, CNRS URA 1960, Institut Pasteur, Paris, Fr.
SO Molecular and Biochemical Parasitology (1995), 74(1), 105-11
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier
DT Journal
LA English

L11 ANSWER 63 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:320885 CAPLUS
DN 120:320885
TI A novel strategy for the synthesis of the cysteine-rich protective antigen of the malaria merozoite surface protein (MSP-1): knowledge-based strategy for disulfide formation
AU Spetzler, Jane C.; Rao, Chang; Tam, James P.

CS Med. Cent., Vanderbilt Univ., Nashville, TN, USA
SO International Journal of Peptide & Protein Research (1994), 43(4), 351-8
CODEN: IJPPC3; ISSN: 0367-8377
DT Journal
LA English

L11 ANSWER 64 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:189193 CAPLUS
DN 120:189193
TI Expression and antigenicity of Plasmodium falciparum major merozoite surface protein (MSP119) variants secreted from Saccharomyces cerevisiae
AU Kaslow, David C.; Hui, George; Kumar, Snajai
CS Mol. Vaccine Sect., Inst. Allergy Infect. Dis., Bethesda, MD, 20892, USA
SO Molecular and Biochemical Parasitology (1994), 63(2), 283-9
CODEN: MBIPDP; ISSN: 0166-6851
DT Journal
LA English

L11 ANSWER 65 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:319008 CAPLUS
DN 120:319008
TI Expression of the 19-kilodalton carboxy-terminal fragment of the Plasmodium falciparum merozoite surface protein-1 in Escherichia coli as a correctly folded protein
AU Burghaus, Petra A.; Holder, Anthony A.
CS Div. Parasitol., Natl. Inst. Med. Res., London, UK
SO Molecular and Biochemical Parasitology (1994), 64(1), 165-9
CODEN: MBIPDP; ISSN: 0166-6851
DT Journal
LA English

L11 ANSWER 66 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:296236 CAPLUS
DN 120:296236
TI Immunization against malaria with a recombinant protein
AU Ling, I.T.; Ogun, S.A.; Holder, A.A.
CS Div. Parasitol., Natl. Inst. Med. Res., London, NW7 1AA, UK
SO Parasite Immunology (1994), 16(2), 63-7
CODEN: PAIMD8; ISSN: 0141-9838
DT Journal
LA English

L11 ANSWER 67 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1993:623738 CAPLUS
DN 119:223738
TI Immunological cross-reactivity of the C-terminal 42-kilodalton fragment of Plasmodium falciparum merozoite surface protein 1 expressed in baculovirus
AU Hui, George S. N.; Hashiro, Carole; Nikaido, Caryn; Case, Stephen E.; Hashimoto, Ann; Gibson, Helen; Barr, Philip J.; Chang, Sandra P.
CS Dep. Trop. Med., Univ. Hawaii, Honolulu, HI, 96816, USA
SO Infection and Immunity (1993), 61(8), 3403-11
CODEN: INFIBR; ISSN: 0019-9567
DT Journal
LA English

L11 ANSWER 68 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 18
AN 1993:557824 CAPLUS
DN 119:157824
TI A recombinant 15-kilodalton carboxyl-terminal fragment of Plasmodium yoelii yoelii 17XL merozoite surface protein 1 induces a protective immune response in mice
AU Daly, Thomas M.; Long, Carole A.

CS Dep. Microbiol. Immunol., Hahnemann Univ., Philadelphia, PA, 19102, USA
SO Infection and Immunity (1993), 61(6), 2462-7
CODEN: INFIBR; ISSN: 0019-9567
DT Journal
LA English

L11 ANSWER 69 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1993:469957 CAPLUS
DN 119:69957
TI Analysis of sequence diversity in the Plasmodium falciparum merozoite surface protein-1 (MSP-1)
AU Miller, Louis H.; Roberts, Theodore; Shahabuddin, Mohammed; McCutchan, Thomas F.
CS Lab. Malaria Res., Natl. Inst. Allergy and Infect. Dis., Bethesda, MD, USA
SO Molecular and Biochemical Parasitology (1993), 59(1), 1-14
CODEN: MBIPDP; ISSN: 0166-6851
DT Journal
LA English

L11 ANSWER 70 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70939 Peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-2 N-terminus.

L11 ANSWER 71 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70938 Peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
CR N-PSDB: ABS55097
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1His C-terminus.

L11 ANSWER 72 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70937 Peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201

PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
CR N-PSDB: ABS55095
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1 N-terminus.

L11 ANSWER 73 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70936 peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein peptide linker #3.

L11 ANSWER 74 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70935 peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein peptide linker #2.

L11 ANSWER 75 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70934 peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein peptide linker #1.

L11 ANSWER 76 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70933 protein DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W

PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-2.

L11 ANSWER 77 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70932 protein DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-2His.

L11 ANSWER 78 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70931 protein DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1.

L11 ANSWER 79 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAB37612 protein DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
DESC Human EGF.

L11 ANSWER 80 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAB37611 protein DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as

vaccines for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
DESC Merozoite surface protein-1.

L11 ANSWER 81 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAB37610 Protein DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
CR N-PSDB: AAC68978
DESC Merozoite surface protein-133.

L11 ANSWER 82 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAB37609 Protein DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
CR N-PSDB: AAC68977
DESC Merozoite surface protein-119.

L11 ANSWER 83 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAB37608 protein DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent

LA English
OS 2001-015762 [02]
DESC Merozoite surface protein-1.

L11 ANSWER 84 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAW22592 Protein DGENE
TI Recombinant protein containing **Plasmodium merozoite surface protein**-1 p42 fragment - useful in antimalarial **vaccines**, also new antibodies for diagnosis and protein purification
IN Barnwell J W; Longacre-Andre S; Mendis K; Nato F; Roth C
PA (INSP) INST PASTEUR.
(UYNY) UNIV NEW YORK STATE.
PI WO 9730159 A2 19970821 85p
AI WO 1997-FR291 19970214
PRAI FR 1996-1821 19960214
DT Patent
LA French
OS 1997-425034 [39]
CR P-PSDB: AAW22592
DESC PfMSP1(p19)A protein sequence.

L11 ANSWER 85 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAW22593 Protein DGENE
TI Recombinant protein containing **Plasmodium merozoite surface protein**-1 p42 fragment - useful in antimalarial **vaccines**, also new antibodies for diagnosis and protein purification
IN Barnwell J W; Longacre-Andre S; Mendis K; Nato F; Roth C
PA (INSP) INST PASTEUR.
(UYNY) UNIV NEW YORK STATE.
PI WO 9730159 A2 19970821 85p
AI WO 1997-FR291 19970214
PRAI FR 1996-1821 19960214
DT Patent
LA French
OS 1997-425034 [39]
CR P-PSDB: AAW22592
DESC PfMSP1(p19)S protein sequence.

L11 ANSWER 86 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55098 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
CR P-PSDB: ABG70939
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-2 N-terminus DNA.

L11 ANSWER 87 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55097 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of

malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
CR P-PSDB: ABG70938
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1His C-terminus DNA.

L11 ANSWER 88 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55096 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1 C-terminus DNA.

L11 ANSWER 89 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55095 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
CR P-PSDB: ABG70937
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1 N-terminus DNA.

L11 ANSWER 90 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55094 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-2 associated DNA #1.

L11 ANSWER 91 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN

AN ABS55093 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1 associated DNA #2.

L11 ANSWER 92 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55092 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1 associated DNA #1.

L11 ANSWER 93 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAC68978 DNA DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
CR P-PSDB: AAB37610
DESC Merozoite surface protein-133 coding sequence.

L11 ANSWER 94 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAC68977 DNA DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent

LA English
OS 2001-015762 [02]
CR P-PSDB: AAB37609
DESC Merozoite surface protein-119 coding sequence.

L11 ANSWER 95 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAC68976 DNA DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
DESC Merozoite surface protein-142 coding sequence.

L11 ANSWER 96 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAT80404 DNA DGENE
TI Recombinant protein containing **Plasmodium merozoite surface protein**-1 p42 fragment - useful in antimalarial **vaccines**, also new antibodies for diagnosis and protein purification
IN Longacreandre S; Roth C; Nato F; Barnwell J W; Mendis K
PA (INSP) INST PASTEUR.
(UYNY) UNIV NEW YORK STATE.
PI WO 9730159 A2 19970821 85p
AI WO 1997-FR291 19970214
PRAI FR 1996-1821 19960214
DT Patent
LA French
OS 1997-425034 [39]
CR P-PSDB: AAW22592
DESC PfMSP1(p19)S coding sequence.

L11 ANSWER 97 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAT80403 DNA DGENE
TI Recombinant protein containing **Plasmodium merozoite surface protein**-1 p42 fragment - useful in antimalarial **vaccines**, also new antibodies for diagnosis and protein purification
IN Longacreandre S; Roth C; Nato F; Barnwell J W; Mendis K
PA (INSP) INST PASTEUR.
(UYNY) UNIV NEW YORK STATE.
PI WO 9730159 A2 19970821 79p
AI WO 1997-FR291 19970214
PRAI FR 1996-1821 19960214
DT Patent
LA French
OS 1997-425034 [39]
CR P-PSDB: AAW22592
DESC PfMSP1(p19)A coding sequence.

L11 ANSWER 98 OF 99 DRUGUPDATES COPYRIGHT 2003 IMSWORLD on STN

ACCESSION NUMBER: 2002:32 DRUGUPDATES
SOURCE: R&D Focus, (14 Jan 2002)

GENERIC NAME: **vaccine, MSP-5; vaccine, merozoite surface protein 5; vaccine, malaria, Progen**
STRUCTURE:
STRUCTURE DIAGRAM IS NOT AVAILABLE
CLASSIFICATION: **J7A9 Other Unspecified Vaccines**
HIGHEST DEV. PHASE: Preclinical (20)

COMPANY INFORMATION:

Type	Company	Nationality
Originator	Progen	Australia

L11 ANSWER 99 OF 99 DRUGUPDATES COPYRIGHT 2003 IMSWORLD on STN

ACCESSION NUMBER: 2002:31 DRUGUPDATES
SOURCE: R&D Focus, (14 Jan 2002)
GENERIC NAME: **vaccine, MSP-4; vaccine, merozoite surface protein 4; vaccine, malaria, Progen**
STRUCTURE:
STRUCTURE DIAGRAM IS NOT AVAILABLE
CLASSIFICATION: **J7A9 Other Unspecified Vaccines**
HIGHEST DEV. PHASE: Preclinical (20)

COMPANY INFORMATION:

Type	Company	Nationality
Originator	Progen	Australia

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REENTER DISPLAY FORMAT FOR ALL FILES (FILEDEFAULT):filedefault

L11 ANSWER 1 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2003:427004 CAPLUS
DN 139:67488
TI Genetic diversity and antigenic polymorphism in Plasmodium falciparum: Extensive serological cross-reactivity between allelic variants of merozoite surface protein 2
AU Franks, Simon; Baton, Luke; Tetteh, Kevin; Tongren, Eric; Dewin, David; Akanmori, Bartholomew D.; Koram, Kojo A.; Ranford-Cartwright, Lisa; Riley, Eleanor M.
CS Institute of Cell, Animal and Population Biology, University of Edinburgh, Edinburgh, EH9 3JT, UK
SO Infection and Immunity (2003), 71(6), 3485-3495
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 2 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2003:277216 CAPLUS
DN 139:67468
TI Repeat sequences in block 2 of Plasmodium falciparum merozoite surface protein 1 are targets of antibodies associated with protection from malaria
AU Polley, Spencer D.; Tetteh, Kevin K. A.; Cavanagh, David R.; Pearce, Richard J.; Lloyd, Jennifer M.; Bojang, Kalifa A.; Okenu, Daniel M. N.; Greenwood, Brian M.; McBride, Jana S.; Conway, David J.
CS London School of Hygiene and Tropical Medicine, London, WC1E 7HT, UK
SO Infection and Immunity (2003), 71(4), 1833-1842
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 3 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 1
AN 2003:364869 CAPLUS
DN 139:132142
TI Development and pre-clinical analysis of a Plasmodium falciparum Merozoite

Surface Protein-142 malaria **vaccine**
AU Angov, Evelina; Aufiero, Barbara M.; Turgeon, Ann Marie; Van Handenhove, Michel; Ockenhouse, Christian F.; Kester, Kent E.; Walsh, Douglas S.; McBride, Jana S.; Dubois, Marie-Claude; Cohen, Joe; Haynes, J. David; Eckels, Kenneth H.; Heppner, D. Gray; Ballou, W. Ripley; Diggs, Carter L.; Lyon, Jeffrey A.
CS WRAIR, Department of Immunology, Silver Spring, MD, 20910, USA
SO Molecular and Biochemical Parasitology (2003), 128(2), 195-204
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier Science B.V.
DT Journal
LA English
RE.CNT 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 4 OF 99 BIOTECHDS COPYRIGHT 2003 THOMSON DERWENT/ISI on STN
AN 2003-04163 BIOTECHDS
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria;
vector-mediated gene transfer and expression in host cell for recombinant **vaccine** and infection therapy
AU PAN W
PA UNIV SECOND MILITARY MEDICAL
PI WO 2002072625 19 Sep 2002
AI WO 2002-CN49 1 Feb 2002
PRAI CN 2001-105292 1 Feb 2001; CN 2001-105292 1 Feb 2001
DT Patent
LA German
OS WPI: 2002-723317 [78]

L11 ANSWER 5 OF 99 IFIPAT COPYRIGHT 2003 IFI on STN DUPLICATE 3
AN 10216310 IFIPAT;IFIUDB;IFICDB
TI MALARIA **VACCINE**
IN Birdsall Berry (GB); Feeney James (GB); Holder Anthony (GB); Morgan William (GB); Syed Shabih (GB); Uthaipibull Chairat (TH)
PA Unassigned Or Assigned To Individual (68000)
PI US 2002160017 A1 20021031
AI US 2001-978756 20011016
PRAI GB 1999-90722 19990420
CA 1999-2271451 19990525
FI US 2002160017 20021031
DT Utility; Patent Application - First Publication
FS CHEMICAL
APPLICATION
CLMN 36
GI 18 Figure(s).
FIG. 1-MSP-1 sequences aligned according to the EGF-like motif consensus. Top sequence: P. falciparum (SWISS-PROT MSP1 PLAFW). Second sequence: P. vivax Belem strain (PIR A45604). Third sequence: human EGF (PDB legf). Fourth sequence: EGF-like domain consensus (Prosite EGF1). Bottom sequence: 14 residue EGF core region used for structure alignment in FIG. 6. Black highlighting indicates conserved residues of the EGF-like domain. Dark shading shows hydrophobic residues at the EGFmodule pair interface in the P. falciparum, and corresponding conserved residues in the P. vivax sequence.
FIG. 2-Sample of multidimensional heteronuclear NOESY experiments showing planes containing NOE connections to the MSP-1 C-terminal fragment Lys35 NH proton. Top: 13C (D4) and 1H(D3) plane from the 4D-(13C)-HMQC-NOESY-(15N)-HSQC experiment, taken at the chemical shift values of Lys35 NH in 15N(D2) and 1H(D1). Bottom: strip from the 3D (15N)-NOESY-HSQC at the 1H chemical shift value of Lys35 NH (vertical axis, D1) taken at the plane

of its 15N (D3) value. The horizontal 1H axis is aligned with that of the top spectrum. The weak cross-peaks at 2.72 and 3.01 ppm in the 3D spectrum do not show corresponding cross-peaks in the 4D spectrum because of the lower signal-tonoise ratio in the latter. These peaks have been assigned as the cross-peaks between Lys35 NH and Asn44 H beta 2 (2.72 ppm), and Cys30 H beta 3 and/or Cys41 H beta 2 (3.01 ppm).

FIG. 3-Stereo drawing showing the backbone C, N, Ca atoms of the 32 refined structures in the final ensemble. The domain-1 is on the left (red), with domain-2 on the right (green), and both the N- and C-termini are near the bottom.

FIG. 4-MOLSCRIPT picture of the most representative model of the ensemble, showing the backbone C alpha trace, antiparallel beta -sheet elements, and disulphide bridges (S gamma atoms in yellow). Domain-1, red; Domain-2, green.

FIG. 5-Alignment of typical EGF-like family members with the fitpdb program, using the 14 amino acid "reduced core" consensus (Bersch et al., 1998) (see FIG. 1). The aligned backbone segment in each structure is white. The structures are aligned relative to the most representative structure of the group (factor Xa), with increasing divergence from left to right. Numbers indicate the rmsd value of the aligned C, N, C alpha atoms. PDB identification codes: factor Xa (crystal structure), 1hcg; Complement C1r component, 1apq (14th model); human EGF, 1egf (11th model); fibrillin-1, domains-32 and -33, 1emn (minimized average structure); transforming growth factoralpha, 2tgf (minimized average structure); MSP-1 domains-1 and -2, this study.

FIG. 6-Backbone ribbon view of fibrillin-1 versus MSP-1 EGF module pair arrangements. Fibrillin-1 (1emn) cyan (domain-32) and magenta (domain-33) (Downing et al., 1996); MSP-1 domain-1 (yellow) and domain-2 (green). Structures were aligned as in FIG. 6 by the core consensus of the N-terminal domain of each pair. The bound Ca2+ ions in the fibrillin-1 structure are shown as magenta spheres.

FIG. 7-Two views, a and b, (rotated 180 degrees about the y-axis) of the electrostatic potential surface of the MSP-1 EGF module pair, calculated with GRASP. Red indicates negative charge, blue indicates positive charge, and white is neutral. The orientation of the views is shown by the adjacent worm diagrams.

FIG. 8-CPK model of the MSP-1 C-terminal fragment, showing the location of some mutations that affect binding of monoclonal antibodies. Domain-I is towards the top and right sides, and domain-2 towards the bottom left.

FIG. 9-Examples of the binding of monoclonal antibodies to GSTMSP-119 detected by Western blotting. The binding of each monoclonal antibody to protein based on the wild type sequence and to proteins containing modified sequences is shown. The monoclonal antibodies are shown across the top. On the left is shown the proteins: WT, wild type sequence; 22, Leu22 to Arg; 26, Glu26 to Ile; 15, Asn15 to Arg; 27, Glu27 to Tyr; 31, Leu31 to Arg; 43, Glu43 to Leu; 27+31+43, Glu27 to Tyr and Leu31 to Arg and Glu43 to Leu; 15+27+31+43, Asn15 to Arg and Glu27 to Tyr and Leu31 to Arg and Glu43 to Leu.

FIG. 10-The binding of monoclonal antibodies to GST-MSP-119 detected by BIAcore analysis. The binding of each monoclonal antibody is normalised to 100% binding to protein based on the wild type sequence and the binding of proteins containing modified sequences is expressed as a percentage of this. WT, wild type sequence; 15, Asn 15 Arg; 26, Glu26 Ile; 27, Glu27 Tyr; 31, Leu31 Arg; 34, Tyr34 Ser; 43 Glu43 Leu.

FIG. 11-The binding of monoclonal antibodies to GST-MSP-119 containing multiple modifications detected by BIAcore analysis. The binding of each monoclonal antibody is normalised to 100% binding to protein based on the wild type sequence and the binding of proteins containing modified sequences is expressed as a percentage of this. WT, wild type sequence; The combinations contain 3 mutations (27+31+43), or 4 mutations ((27+31+34+43) and (15+27+31+43)), at each site the changes are those identified in FIG. 10.

FIG. 12-Identification of blocking antibodies using a competitive binding

assay and immobilised wild type GST-MSP-119. The ability of antibodies to compete with the binding of mAbs 12.8 and 12.10 to GST-MSP-119 was measured using BIAcore analysis. Individual antibodies (x-axis) were bound to the antigen and then the amount of either 12.8 or 12.10 (inhibitory mAb) that could subsequently bind was quantified. The amount of binding is presented as a percentage of the total amount of either 12.8 or 12.10 bound in the absence of pre-incubation with another antibody.

FIG. 13-Antibodies induced by immunisation with a modified recombinant MSP-119 assayed for their ability to inhibit secondary processing. Washed 3D7 merozoites were either analysed directly without incubation (0 h) or incubated for 1 hour at 37 degrees C. in the presence of no serum (no serum), 1 mM PMSF as a control for complete inhibition, normal rabbit sera (normal serum), or serum from a rabbit immunised with the 15+27+31+43 modified protein (immune serum), all at 1:10 dilution in reaction buffer. The level of MSP-133 released into the supernatant as a results of secondary processing was measured using an ELISA method and is represented by Absorbance at 492 nmn.

FIG. 14. Pichia pastoris codon preference table used for input to the CODOP program.

FIG. 15. DNA and protein sequences for the optimized synthetic MSP-142 gene. A: Complete sequence designed for optimum codon usage and expression in P. pastoris. B: Sequence of the synthetic MSP-119 construct in the expression vector pPIC9K-HXa. Uppercase letters: vector sequences, including the His6 tag and factor Xa cleavage site (IEGR). Lowercase letters: synthetic MSP-119 coding sequence. The cloned sequence in located at the SnaBI restriction site of the pPIC9K sequence. C: Expressed protein sequence of the synthetic MSP-1 19 construct. The sequence shown is produced as a fusion to the pPIC9K alpha-factor secretion signal, following the kex2/STE13 processing sites. The synthetic MSP-119 is in bold-face type. D: Sequence of the MSP-133 construct. The cloned sequence is located at the SmaI site of the pUC118 vector. E: Predicted protein sequence of the synthetic MSP-133 construct translation product.

FIG. 16. Gene assembly PCR reactions for the MSP-133 and MSP-119 sequences. Reaction 1:10 mu L aliquots of the assembly reactions. Reaction 2:20 mu L aliquots of the amplification reactions. The N-terminal and middle fragments were subsequently spliced together to form the MSP-133 synthetic construct. The C-terminal fragment synthesis reactions produced the optimized MSP-119 construct.

FIG. 17. Expression of the synthetic MSP-119 protein in P. pastoris. Lanes 1-6: trichloroacetic acid precipitates of secreted recombinant protein from culture supernatants, without further purification (5 mu L each). Samples from duplicate cultures of three independent transformants. Lane 8,9: purified, deglycosylated MSP-119 produced from the original P. falciparum sequence. Lane 7,10: NOVEX molecular weight markers.

FIG. 18. A: (1H/15N)-HSQC spectrum of the protein (2.5 mM) expressed from the optimized synthetic MSP-119 gene. B: Control (1H/15N)-HSQC of deglycosylated protein (2.2 mM) expressed from the original P. falciparum sequence (Morgan et al., 1999).

L11 ANSWER 6 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:736281 CAPLUS
DN 137:261873
TI Recombinant Plasmodium vivax merozoite protein p42: Diagnosis and therapy
IN Lanar, David E.; Dutta, Sheetij; Ware, Lisa A.
PA Walter Reed Army Institute of Research, USA
SO PCT Int. Appl., 71 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI	WO 2002074802	A2	20020926	WO 2002-US8307	20020318
	WO 2002074802	A3	20030703		
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	US 2003157650	A1	20030821	US 2002-100699	20020318
PRAI	US 2001-277002P	P	20010319		

L11 ANSWER 7 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:965183 CAPLUS
DN 138:38063
TI Recombinant expression of human malaria pathogen - Plasmodium falciparum merozoite surface protein-1 antigen p42 in transgenic plants
IN Chang, Sandra P.; Christopher, David A.; Vine, Benjamin; Su, Wei-Wen; Bugos, Robert
PA USA
SO U.S. Pat. Appl. Publ., 30 pp., Cont.-in-part of U.S. Ser. No. 500,376.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002194648	A1	20021219	US 2002-98514	20020311
PRAI	US 2000-500376	A2	20000208		
	US 2001-274599P	P	20010309		

L11 ANSWER 8 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:963458 CAPLUS
DN 138:249433
TI Mosaic organization and heterogeneity in frequency of allelic recombination of the Plasmodium vivax merozoite surface protein-1 locus
AU Putaporntip, Chaturong; Jongwutiwes, Somchai; Sakihama, Naoko; Ferreira, Marcelo U.; Kho, Weon-Gyu; Kaneko, Akira; Kanbara, Hiroji; Hattori, Tetsuya; Tanabe, Kazuyuki
CS Laboratory of Biology, Osaka Institute of Technology, Osaka, 535-8585, Japan
SO Proceedings of the National Academy of Sciences of the United States of America (2002), 99(25), 16348-16353
CODEN: PNASA6; ISSN: 0027-8424
PB National Academy of Sciences
DT Journal
LA English
RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 9 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:815715 CAPLUS
DN 137:293240
TI Nature and specificity of the required protective immune response that develops postchallenge in mice vaccinated with the 19-kilodalton fragment of Plasmodium yoelii merozoite surface protein 1
AU Wipasa, Jiraprapa; Xu, Huji; Makobongo, Morris; Gatton, Michelle; Stowers, Anthony; Good, Michael F.
CS Cooperative Research Center for Vaccine Technology, Queensland Institute of Medical Research, Herston, 4029, Australia
SO Infection and Immunity (2002), 70(11), 6013-6020

CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 10 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2002:298599 CAPLUS
DN 137:44140
TI Truncation of merozoite surface protein 3 disrupts its trafficking and that of acidic-basic repeat protein to the surface of Plasmodium falciparum merozoites
AU Mills, Kerry E.; Pearce, J. Andrew; Crabb, Brendan S.; Cowman, Alan F.
CS The Walter and Eliza Hall Institute of Medical Research, Melbourne, 3050, Australia
SO Molecular Microbiology (2002), 43(6), 1401-1411
CODEN: MOMIEE; ISSN: 0950-382X
PB Blackwell Publishing Ltd.
DT Journal
LA English
RE.CNT 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 11 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 4
AN 2002:87811 CAPLUS
DN 136:246020
TI Protective immune responses to the 42-kilodalton (kDa) region of Plasmodium yoelii merozoite surface protein 1 are induced by the C-terminal 19-kDa region but not by the adjacent 33-kDa region
AU Ahlborg, Niklas; Ling, Irene T.; Howard, Wendy; Holder, Anthony A.; Riley, Eleanor M.
CS Institute of Cell, Animal and Population Biology, Edinburgh University, Edinburgh, EH9 3JT, UK
SO Infection and Immunity (2002), 70(2), 820-825
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 12 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2003:279194 CAPLUS
DN 138:352452
TI Specificities of antibodies to Plasmodium falciparum merozoite surface protein (MSP)-119
AU Nwuba, R. I.; Adoro, S. A.; Anumudu, C. I.; Odaibo, A. B.; Omosun, Y.; Holder, A. A.; Nwagwu, M.
CS Cellular Parasitology Programme, Department of Zoology, University of Ibadan, Ibadan, Nigeria
SO Parasitology--ICOPA X: Symposia, Workshops and Contributed Papers, Proceedings of the International Congress, 10th, Vancouver, BC, Canada, Aug. 4-9, 2002 (2002), 477-486 Publisher: Monduzzi Editore, Bologna, Italy.
CODEN: 69DTB8; ISBN: 88-323-2804-6
DT Conference
LA English
RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L11 ANSWER 13 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 5
AN 2002:181617 CAPLUS

DN 137:44057
TI The Plasmodium vivax homologues of merozoite surface proteins 4 and 5 from Plasmodium falciparum are expressed at different locations in the merozoite
AU Black, Casilda G.; Barnwell, John W.; Huber, Curtis S.; Galinski, Mary R.; Coppel, Ross L.
CS Department of Microbiology, Monash University, Calyton, 3800, Australia
SO Molecular and Biochemical Parasitology (2002), 120(2), 215-224
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier Science Ireland Ltd.
DT Journal
LA English
RE.CNT 57 THERE ARE 57 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 14 OF 99 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
AN 2002:236311 BIOSIS
DN PREV200200236311
TI Merozoite surface protein-9 of Plasmodium vivax and related simian malaria parasites is orthologous to p101/ABRA of P. falciparum.
AU Vargas-Serrato, Esmeralda; Barnwell, John W.; Ingravallo, Paul; Perler, Francine B.; Galinski, Mary R. (1)
CS (1) Department of Medicine, Emory Vaccine Research Center, Yerkes Primate Research Center, Emory University, 954 Gatewood Rd., Atlanta, GA, 30329: galinski@rmy.emory.edu USA
SO Molecular & Biochemical Parasitology, (March, 2002) Vol. 120, No. 1, pp. 41-52. print.
ISSN: 0166-6851.
DT Article
LA English

L11 ANSWER 15 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:473700 CAPLUS
DN 135:209568
TI Naturally acquired antibody responses to Plasmodium falciparum merozoite surface protein 4 in a population living in an area of endemicity in Vietnam
AU Wang, Lina; Richie, Thomas L.; Stowers, Anthony; Nhan, Doan Hanh; Coppel, Ross L.
CS Department of Microbiology, Monash University, Clayton, 3800, Australia
SO Infection and Immunity (2001), 69(7), 4390-4397
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 16 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:215868 CAPLUS
DN 134:309752
TI Efficacy of two alternate **vaccines** based on Plasmodium falciparum merozoite surface protein 1 in an Aotus challenge trial
AU Stowers, Anthony W.; Cioce, Vittoria; Shimp, Richard L.; Lawson, Mark; Hui, George; Muratova, Olga; Kaslow, David C.; Robinson, Robin; Long, Carole A.; Miller, Louis H.
CS Malaria Vaccine Development Unit, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Rockville, MD, USA
SO Infection and Immunity (2001), 69(3), 1536-1546
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English

RE.CNT 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L11 ANSWER 17 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:855406 CAPLUS
DN 136:230847
TI High-Level Production and Purification of P30P2MSP119, an Important **Vaccine** Antigen for Malaria, Expressed in the Methylotropic Yeast Pichia pastoris
AU Brady, Ciaran P.; Shimp, Richard L.; Miles, Aaron P.; Whitmore, Michael; Stowers, Anthony W.
CS Malaria Vaccine Development Unit, Laboratory of Parasitic Diseases, National Institutes of Allergy and Infectious Diseases, National Institutes of Health, Rockville, MD, 20852, USA
SO Protein Expression and Purification (2001), 23(3), 468-475
CODEN: PEXPEJ; ISSN: 1046-5928
PB Academic Press
DT Journal
LA English
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 18 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:567132 CAPLUS
DN 136:304762
TI Sequence diversity and linkage disequilibrium within the merozoite surface protein-1 (Msp-1) locus of Plasmodium falciparum: a longitudinal study in Brazil
AU Da Silveira, Lucimeire A.; Ribeiro, Weber L.; Kirchgatter, Karin; Wunderlich, Gerhard; Matsuoka, Hiroyuki; Tanabe, Kazuyuki; Ferreira, Marcelo U.
CS Department of Parasitology, Institute for Biomedical Sciences, University of Sao Paulo, Sao Paulo, 05508-900, Brazil
SO Journal of Eukaryotic Microbiology (2001), 48(4), 433-439
CODEN: JEMIED; ISSN: 1066-5234
PB Society of Protozoologists
DT Journal
LA English
RE.CNT 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 19 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 6
AN 2001:389935 CAPLUS
DN 135:208010
TI Merozoite surface protein 8 of Plasmodium falciparum contains two epidermal growth factor-like domains
AU Black, C. G.; Wu, T.; Wang, L.; Hibbs, A. R.; Coppel, R. L.
CS Department of Microbiology, Monash University, Victoria, 3800, Australia
SO Molecular and Biochemical Parasitology (2001), 114(2), 217-226
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier Science Ireland Ltd.
DT Journal
LA English
RE.CNT 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 20 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:105812 CAPLUS
DN 134:264845
TI Low CD4+ T cell responses to the C-terminal region of the malaria merozoite surface protein-1 may be attributed to processing within distinct MHC class II pathways
AU Quin, Stuart J.; Seixas, Elsa M. G.; Cross, Caroline A.; Berg, Matthias;

Lindo, Vivian; Stockinger, Brigitta; Langhorne, Jean
CS National Institute for Medical Research, London, UK
SO European Journal of Immunology (2001), 31(1), 72-81
CODEN: EJIMAF; ISSN: 0014-2980
PB Wiley-VCH Verlag GmbH
DT Journal
LA English
RE.CNT 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 21 OF 99 PROMT COPYRIGHT 2003 Gale Group on STN

ACCESSION NUMBER: 2000:1063828 PROMT
TITLE: EUROPEAN PATENT DISCLOSURES.
SOURCE: BIOWORLD Today, (7 Dec 2000) Vol. 11, No. 236.
PUBLISHER: American Health Consultants, Inc.
DOCUMENT TYPE: Newsletter
LANGUAGE: English
WORD COUNT: 1952
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L11 ANSWER 22 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 7
AN 2000:756742 CAPLUS
DN 133:334041
TI **Vaccine**
IN Holder, Anthony; Birdsall, Berry; Feeney, James; Morgan, William; Syed, Shabih; Uthaipibull, Chairat
PA Medical Research Council, UK
SO PCT Int. Appl., 126 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000063245	A2	20001026	WO 2000-GB1558	20000420
	WO 2000063245	A3	20010503		
	WO 2000063245	C2	20020829		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	CA 2271451	AA	20001020	CA 2000-2271451	19990525
	EP 1180120	A2	20020220	EP 2000-920918	20000420
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	BR 2000009823	A	20020409	BR 2000-9823	20000420
	JP 2002543774	T2	20021224	JP 2000-612331	20000420
	US 2002160017	A1	20021031	US 2001-978756	20011016
PRAI	GB 1999-9072	A	19990420		
	US 1999-311817	A	19990513		
	CA 1999-2271451	A	19990525		
	WO 2000-GB1558	W	20000420		

L11 ANSWER 23 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 8
AN 2000:685462 CAPLUS
DN 133:333670
TI Immunization with recombinant Plasmodium yoelii merozoite surface protein

4/5 protects mice against lethal challenge
AU Kedzierski, Lukasz; Black, Casilda G.; Coppel, Ross L.
CS Department of Microbiology, Monash University, Victoria, 3800, Australia
SO Infection and Immunity (2000), 68(10), 6034-6037
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 24 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2000:282557 CAPLUS
DN 133:41848
TI Characterization of conserved T- and B-cell epitopes in Plasmodium falciparum major merozoite surface protein
AU Parra, Marcela; Hui, George; Johnson, Armead H.; Berzofsky, Jay A.; Roberts, Theodore; Quakyi, Isabella A.; Taylor, Diane W.
CS Department of Biology, Georgetown University, Washington, DC, 20057, USA
SO Infection and Immunity (2000), 68(5), 2685-2691
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L11 ANSWER 25 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2000:435281 CAPLUS
DN 134:84824
TI Anti-merozoite surface protein-1 19-kDa IgG in mother-infant pairs naturally exposed to Plasmodium falciparum: subclass analysis with age, exposure to asexual parasitemia, and protection against malaria. V. The Asembo Bay Cohort Project
AU Branch, OraLee H.; Oloo, Aggrey J.; Nahlen, Bernard L.; Kaslow, David; Lal, Altaf A.
CS Division of Parasitic Diseases, Emory University, Atlanta, GA, USA
SO Journal of Infectious Diseases (2000), 181(5), 1746-1752
CODEN: JIDIAQ; ISSN: 0022-1899
PB University of Chicago Press
DT Journal
LA English
RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L11 ANSWER 26 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:27566 CAPLUS
DN 135:206058
TI Production of the major merozoite surface protein 1 (MSP1) of Plasmodium falciparum in Pichia pastoris
AU Zhang, Dong-mei; Pan, Wei-qing; Lu, De-ru
CS Department of Aetiologic Biology, Second Military Medical University, Shanghai, 200433, Peop. Rep. China
SO Shengwu Gongcheng Xuebao (2000), 16(6), 723-726
CODEN: SGXUED; ISSN: 1000-3061
PB Kexue Chubanshe
DT Journal
LA Chinese

L11 ANSWER 27 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2001:13659 CAPLUS
DN 134:217885
TI Temporal and spatial distribution of the variants of merozoite surface

protein-1 (MSP-1) in Plasmodium falciparum populations in Brazil
AU Silva, N. S.; Silveira, L. A.; Machado, R. L. D.; Povoa, M. M.; Ferreira, M. U.
CS Laboratorio de Parasitologia Molecular, Departamento de Doencas Infecciosas e Parasitarias, Faculdade de Medicina e Enfermagem de Sao fose do Rio Preto, Sao fose do Rio Preto, Brazil
SO Annals of Tropical Medicine & Parasitology (2000), 94(7), 675-688
CODEN: ATMPA2; ISSN: 0003-4983
PB Carfax Publishing
DT Journal
LA English
RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L11 ANSWER 28 OF 99 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
AN 2001:13399 BIOSIS
DN PREV200100013399
TI Hypervariability in a leading Plasmodium vivax malaria **vaccine** candidate, C-terminal Merozoite Surface Protein 1.
AU Manamperi, A. (1); Holm, I.; Perera, L.; Handunnetti, S. M.; Longacre, S.
CS (1) Departement d'Immunologie, Institut Pasteur, Paris France
SO American Journal of Tropical Medicine and Hygiene, (March, 2000) Vol. 62, No. 3 Supplement, pp. 389. print.
Meeting Info.: 49th Annual Meeting of the American Society of Tropical Medicine and Hygiene Houston, Texas, USA October 29-November 02, 2000 American Society of Tropical Medicine and Hygiene
. ISSN: 0002-9637.
DT Conference
LA English
SL English

L11 ANSWER 29 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2000:481778 CAPLUS
DN 134:114469
TI Biochemical and immunological properties of a viral hybrid particle expressing the Plasmodium vivax merozoite surface protein 1 C-terminal region
AU Wunderlich, Gerhard; del Portillo, Hernando A.
CS Departamento de Parasitologia, Instituto Ciencias Biomedicas II, Universidade de Sao Paulo, Sao Paulo, Brazil
SO Molecular Medicine (New York) (2000), 6(3), 238-245
CODEN: MOMEF3; ISSN: 1076-1551
PB Johns Hopkins University Press
DT Journal
LA English
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L11 ANSWER 30 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2000:605485 CAPLUS
DN 135:56684
TI Plasmodium vivax: Polymorphism in the Merozoite Surface Protein 1 Gene from Wild Colombian Isolates
AU Gutierrez, Arturo; Vicini, Javier; Patarroyo, Manuel Elkin; Murillo, Luis Angel; Patarroyo, Manuel Alfonso
CS Instituto de Immunologia, Hospital San Juan de Dio, Universidad Nacional de Columbia, Santafe de Bogota D.C., Colombia
SO Experimental Parasitology (2000), 95(3), 215-219
CODEN: EXPAAA; ISSN: 0014-4894
PB Academic Press
DT Journal
LA English
RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L11 ANSWER 31 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 9
AN 2000:430973 CAPLUS
DN 134:69982
TI Recombinant chimeric proteins generated from conserved regions of Plasmodium falciparum merozoite surface protein 2 generate antiparasite humoral responses in mice
AU Lawrence, Nicole; Stowers, Anthony; Mann, Victoria; Taylor, Darrin; Saul, Allan
CS Australian Centre for International, The University of Queensland, 4029, Australia
SO Parasite Immunology (2000), 22(5), 211-221
CODEN: PAIMD8; ISSN: 0141-9838
PB Blackwell Science Ltd.
DT Journal
LA English
RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L11 ANSWER 32 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 2000:304108 CAPLUS
DN 133:118652
TI Identification of a novel antigenic domain of Plasmodium falciparum merozoite surface protein-1 that specifically binds to human erythrocytes and inhibits parasite invasion, in vitro
AU Nikodem, D.-P.; Davidson, E.-A.
CS Department of Biochemistry and Molecular Biology, Georgetown University Medical Center, Washington, DC, USA
SO Molecular and Biochemical Parasitology (2000), 108(1), 79-91
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier Science Ireland Ltd.
DT Journal
LA English
RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 33 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:762287 CAPLUS
DN 132:205195
TI Sequence diversity of the merozoite surface protein 1 of Plasmodium falciparum in clinical isolates from the Kilombero District, Tanzania
AU Jiang, G.; Daubenberger, C.; Huber, W.; Matile, H.; Tanner, M.; Pluschke, G.
CS Swiss Tropical Institute, Basel, CH-4002, Switz.
SO Acta Tropica (2000), 74(1), 51-61
CODEN: ACTRAQ; ISSN: 0001-706X
PB Elsevier Science Ireland Ltd.
DT Journal
LA English
RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 34 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 10
AN 2001:838210 CAPLUS
DN 136:33666
TI Identification of a conformational epitope in the carboxylic end of the MSP-1 protein of Plasmodium falciparum
AU Calvo, Julio C.; Satterthwait, Arnold C.
CS Instituto de Inmunologia, Hospital San Juan de Dios, Universidad Nacional de Colombia, Bogota, Colombia
SO Revista Colombiana de Quimica (2000), 29(2), 15-23
CODEN: RCLQAY; ISSN: 0120-2804

PB Universidad Nacional de Colombia, Departamento de Quimica
DT Journal
LA Spanish
RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 35 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:286097 CAPLUS
DN 130:307534
TI Novel modified MSP-1 nucleic acid sequences and methods for increasing mRNA levels and protein expression in cell systems
IN Chen, Li How; Meade, Harry
PA Genzyme Transgenics Corporation, USA
SO PCT Int. Appl., 34 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9920774	A2	19990429	WO 1998-US22226	19981020
	WO 9920774	A3	19990826		
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	AU 9911088	A1	19990510	AU 1999-11088	19981020
	AU 760231	B2	20030508		
	EP 1025244	A2	20000809	EP 1998-953813	19981020
	R: AT, BE, CH, DE, DK, ES, FR, GB, IT, LI, NL, SE, IE				
	BR 9813110	A	20000815	BR 1998-13110	19981020
	JP 2001520048	T2	20011030	JP 2000-517094	19981020
	US 6593463	B1	20030715	US 1998-175684	19981020
	CA 2306796	AA	19990429	CA 1998-2306796	19981028
	US 2002144299	A1	20021003	US 2002-82018	20020220
PRAI	US 1997-62592P	P	19971020		
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	US 1998-175684	A1	19981020		
	WO 1998-US22226	W	19981020		

L11 ANSWER 36 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:291168 CAPLUS
DN 131:72476
TI Levels of antibody to conserved parts of Plasmodium falciparum merozoite surface protein 1 in Ghanaian children are not associated with protection from clinical malaria
AU Dodoo, Daniel; Theander, Thor G.; Kurtzhals, Jorgen A. L.; Koram, Kojo; Riley, Eleanor; Akanmori, Bartholomew D.; Nkrumah, Francis K.; Hviid, Lars
CS Noguchi Memorial Institute for Medical Research, University of Ghana, Legon, Ghana
SO Infection and Immunity (1999), 67(5), 2131-2137
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 37 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1999:775353 CAPLUS
DN 132:249696
TI Phase I trial of two recombinant **vaccines** containing the 19kd carboxy terminal fragment of Plasmodium falciparum merozoite surface protein 1 (msp-119) and T helper epitopes of tetanus toxoid
AU Keitel, W. A.; Kester, K. E.; Atmar, R. L.; White, A. C., Jr.; Bond, N. H.; Holland, C. A.; Krzych, U.; Palmer, D. R.; Egan, A.; Diggs, C.; Ballou, W. R.; Hall, B. F.; Kaslow, D.
CS Department of Microbiology & Immunology, Baylor College of Medicine, Houston, TX, 77030, USA
SO Vaccine (1999), 18(5-6), 531-539
CODEN: VACCDE; ISSN: 0264-410X
PB Elsevier Science Ltd.
DT Journal
LA English
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 38 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 11
AN 1999:239748 CAPLUS
DN 131:72398
TI Testing the efficacy of a recombinant merozoite surface protein (MSP-119) of Plasmodium vivax in Saimiri boliviensis monkeys
AU Collins, William E.; Kaslow, David C.; Sullivan, Joann S.; Morris, Carla L.; Galland, G. Gale; Yang, Chunfu; Saekhou, Ae M.; Xiao, Lihua; Lal, Altaf A.
CS Division of Parasitic Diseases and Scientific Resources Program, Centers for Disease Control and Prevention, National Center for Infectious Diseases, Atlanta, GA, USA
SO American Journal of Tropical Medicine and Hygiene (1999), 60(3), 350-356
CODEN: AJTHAB; ISSN: 0002-9637
PB American Society of Tropical Medicine and Hygiene
DT Journal
LA English
RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 39 OF 99 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 12
AN 1999:60337 CABA
DN 990802999
TI Plasmodium vivax, P. cynomolgi, and P. knowlesi: identification of homologue proteins associated with the surface of merozoites
AU Barnwell, J. W.; Galinski, M. R.; DeSimone, S. G.; Perler, F.; Ingravallo, P.
CS Department of Medical and Molecular Parasitology, New York University School of Medicine, 341 East 25th Street, New York, NY 10010, USA.
SO Experimental Parasitology, (1999) Vol. 91, No. 3, pp. 238-249. 62 ref.
ISSN: 0014-4894
DT Journal
LA English

L11 ANSWER 40 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 13
AN 1999:63392 CAPLUS
DN 130:250884
TI Expression of disulfide-bridge-dependent conformational epitopes and immunogenicity of the carboxy-terminal 19 kDa domain of Plasmodium yoelii merozoite surface protein-1 in live attenuated Salmonella **vaccine** strains
AU Somner, Elizabeth A.; Ogun, Solabomi A.; Sinha, Katharine A.; Valero, Lilian M. Spencer; Lee, Jeong Jin; Harrison, Julia A.; Holder, Anthony A.; Hormaeche, Carlos E.; Khan, C. M. Anjam
CS Department of Microbiology, The Medical School, University of Newcastle, Newcastle upon Tyne, NE2 4HH, UK

SO Microbiology (Reading, United Kingdom) (1999), 145(1), 221-229
CODEN: MROBEO; ISSN: 1350-0872
PB Society for General Microbiology
DT Journal
LA English
RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 41 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:383809 CAPLUS
DN 131:169030
TI Secretion of parasite-specific immunoglobulin G by purified blood B lymphocytes from immune individuals after in vitro stimulation with recombinant Plasmodium falciparum merozoite surface protein-119 antigen
AU Garraud, O.; Diouf, A.; Holm, I.; Nguer, C. M.; Spiegel, A.; Perraut, R.; Longacre, S.
CS Unite d'Immunologie, Institut Pasteur de Dakar, Senegal
SO Immunology (1999), 97(2), 204-210
CODEN: IMMUAM; ISSN: 0019-2805
PB Blackwell Science Ltd.
DT Journal
LA English
RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 42 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:517833 CAPLUS
DN 132:48693
TI Human antibodies to the 19 kDa C-terminal fragment of Plasmodium falciparum merozoite surface protein 1 inhibit parasite growth in vitro
AU Egan, Andrea F.; Burghaus, Petra; Druilhe, Pierre; Holder, Anthony A.; Riley, Eleanor M.
CS Institute of Cell, Animal and Population Biology, Division of Biological Sciences, University of Edinburgh, UK
SO Parasite Immunology (1999), 21(3), 133-139
CODEN: PAIMD8; ISSN: 0141-9838
PB Blackwell Science Ltd.
DT Journal
LA English
RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 43 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 14
AN 1999:46184 CAPLUS
DN 130:310380
TI Antibody response to the N and C-terminal regions of the Plasmodium vivax Merozoite Surface Protein 1 in individuals living in an area of exclusive transmission of P. vivax malaria in the north of Brazil
AU Soares, Irene S.; Oliveira, Salma G.; Souza, Jose M.; Rodrigues, Mauricio M.
CS Centro de Ciencias Biologicas, Departamento de Patologia, Universidade Federal do Para, Belem, 66075-900, Brazil
SO Acta Tropica (1999), 72(1), 13-24
CODEN: ACTRAQ; ISSN: 0001-706X
PB Elsevier Science Ireland Ltd.
DT Journal
LA English
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L11 ANSWER 44 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:297903 CAPLUS
DN 131:167426

TI Plasmodium falciparum: variations in the C-terminal cysteine-rich region of the merozoite surface protein-1 in field samples among Indian isolates
AU Lalitha, P. V.; Malhotra, Pawan; Chattopadhyay, Rana; Chauhan, V. S.
CS International Centre for Genetic Engineering and Biotechnology, New Delhi, 110067, India
SO Experimental Parasitology (1999), 92(1), 12-18
CODEN: EXPAAA; ISSN: 0014-4894
PB Academic Press
DT Journal
LA English
RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L11 ANSWER 45 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:711541 CAPLUS
DN 130:80083
TI Pathways for potentiation of immunogenicity during adjuvant-assisted immunizations with Plasmodium falciparum major merozoite surface protein 1
AU Hui, George S. N.; Hashimoto, Caryn N.
CS Department of Tropical Medicine, University of Hawaii, Honolulu, HI, 96816, USA
SO Infection and Immunity (1998), 66(11), 5329-5336
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L11 ANSWER 46 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:85926 CAPLUS
DN 130:279132
TI Allelic diversity in the merozoite surface protein-1 and epidemiology of multiple-clone Plasmodium falciparum infections in northern Tanzania
AU Ferreira, M. U.; Liu, Q.; Kimura, M.; Ndawi, B. T.; Tanabe, K.; Kawamoto, F.
CS Department of International Health, Nagoya University School of Medicine, Nagoya, Japan
SO Journal of Parasitology (1998), 84(6), 1286-1289
CODEN: JOPAA2; ISSN: 0022-3395
PB American Society of Parasitologists
DT Journal
LA English
RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 47 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 15
AN 1998:408343 CAPLUS
DN 129:147852
TI A longitudinal study of type-specific antibody responses to Plasmodium falciparum merozoite surface protein-1 in an area of unstable malaria in Sudan
AU Cavanagh, David R.; Elhassan, Ibrahim M.; Roper, Cally; Robinson, V. Jane; Giha, Haider; Holder, Anthony A.; Hviid, Lars; Theander, Thor G.; Arnot, David E.; McBride, Jana S.
CS Division of Biological Sciences, Inst. of Cell, Animal and Population Biology, Univ. of Edinburgh, Edinburgh, UK
SO Journal of Immunology (1998), 161(1), 347-359
CODEN: JOIMA3; ISSN: 0022-1767
PB American Association of Immunologists
DT Journal
LA English
RE.CNT 57 THERE ARE 57 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L11 ANSWER 48 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:285209 CAPLUS
DN 129:78992
TI Predicted and observed alleles of Plasmodium falciparum merozoite surface protein-1 (MSP-1), a potential malaria **vaccine** antigen
AU Qari, Shoukat H.; Shi, Ya-Ping; Goldman, Ira F.; Nahlen, Bernard L.; Tibayrenc, Michel; Lal, Altaf A.
CS National Center for Infectious Diseases, Division of Parasitic Diseases, Centers for Disease Control and Prevention (CDC), Atlanta, GA, 303412, USA
SO Molecular and Biochemical Parasitology (1998), 92(2), 241-252
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier Science B.V.
DT Journal
LA English
RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 49 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:458486 CAPLUS
DN 129:226279
TI Construction of a couple of eukaryotic expression recombinants containing the gene fragment of 42kD C-terminal region of Plasmodium falciparum merozoite surface protein 1
AU Miao, Jun; Xue, Caifang; Yu, Qigui
CS Department of Parasitology, Fourth Military Medical University, Xi'an, 710032, Peop. Rep. China
SO Zhonghua Weishengwuxue He Mianyixue Zazhi (1998), 18(3), 186-188
CODEN: ZWMZDP; ISSN: 0254-5101
PB Weishenbu Beijing Shengwu Zhipin Yanjiuso
DT Journal
LA Chinese

L11 ANSWER 50 OF 99 PROMT COPYRIGHT 2003 Gale Group on STN

ACCESSION NUMBER: 1998:8828 PROMT
TITLE: Malaria **Vaccines** Responses to Different MSP-1 Variants May Explain Natural Immunity
SOURCE: Vaccine Weekly, (22 Dec 1997) pp. N/A.
ISSN: 1074-2921.
LANGUAGE: English
WORD COUNT: 533
FULL TEXT IS AVAILABLE IN THE ALL FORMAT

L11 ANSWER 51 OF 99 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1997-425034 [39] WPIDS
DNN N1997-354015 DNC C1997-136077
TI Recombinant protein containing **Plasmodium merozoite surface protein**-1 p42 fragment - useful in antimalarial **vaccines**, also new antibodies for diagnosis and protein purification.
DC B04 C06 D16 S03
IN BARNWELL, J W; LONGACRE-ANDRE, S; MENDIS, K; NATO, F; ROTH, C; LONGACRE, A S; LONGACREANDRE, S
PA (INSP) INST PASTEUR; (UYNY) UNIV NEW YORK STATE; (UYNY) UNIV NEW YORK MEDICAL CENT
CYC 25
PI WO 9730159 A2 19970821 (199739)* FR 79p C12N015-30
RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: AU CA CN JP KP US
FR 2744723 A1 19970814 (199740) 49p C07K014-445
AU 9718842 A 19970902 (199751) C12N015-30

WO 9730159 A3 19971231 (199817) C12N015-30
EP 880589 A2 19981202 (199901) FR C12N015-30
R: AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
JP 2000506381 W 20000530 (200033) 94p C12N015-09
KR 2000065265 A 20001106 (200128) C12N015-30
ADT WO 9730159 A2 WO 1997-FR291 19970214; FR 2744723 A1 FR 1996-1821 19960214; AU 9718842 A AU 1997-18842 19970214; WO 9730159 A3 WO 1997-FR291 19970214; EP 880589 A2 EP 1997-905213 19970214, WO 1997-FR291 19970214; JP 2000506381 W JP 1997-529058 19970214, WO 1997-FR291 19970214; KR 2000065265 A WO 1997-FR291 19970214, KR 1998-711022 19980814
FDT AU 9718842 A Based on WO 9730159; EP 880589 A2 Based on WO 9730159; JP 2000506381 W Based on WO 9730159
PRAI FR 1996-1821 19960214
IC ICM C07K014-445; C12N015-09; C12N015-30
ICS A61K039-015; A61P033-06; C07K016-20; C12N005-10; C12N005-12; C12N005-24; C12N015-02; C12N015-85; C12N015-86; G01N033-53; G01N033-543; G01N033-569
ICA C12P021-08

L11 ANSWER 52 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 16
AN 1997:730326 CAPLUS
DN 128:21566
TI Immunization with a recombinant C-terminal fragment of Plasmodium yoelii merozoite surface protein 1 protects mice against homologous but not heterologous P. yoelii sporozoite challenge
AU Renia, Laurent; Ling, Irene T.; Marussig, Myriam; Miltgen, Francois; Holder, Anthony A.; Mazier, Dominique
CS CHU Pitie-Salpetriere, Paris, Fr.
SO Infection and Immunity (1997), 65(11), 4419-4423
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English
RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 53 OF 99 CABA COPYRIGHT 2003 CABI on STN
AN 1998:67584 CABA
DN 980802773
TI Comparison of protection induced by immunization with recombinant proteins from different regions of merozoite surface protein 1 of Plasmodium yoelii
AU Tian JingHui; Sanjai Kumar; Kaslow, D. C.; Miller, L. H.; Tian, J. H.; Kumar, S.
CS Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, 9000 Rockville Pike, Bethesda, Maryland 20892, USA.
SO Infection and Immunity, (1997) Vol. 65, No. 8, pp. 3032-3036. 18 ref.
ISSN: 0019-9567
DT Journal
LA English

L11 ANSWER 54 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:306951 CAPLUS
DN 127:3998
TI Acquired immune responses to the N- and C-terminal regions of Plasmodium vivax merozoite surface protein 1 in individuals exposed to malaria
AU Soares, Irene S.; Levitus, Gabriela; Souza, Jose M.; Del Portillo, Hernando A.; Rodrigues, Mauricio M.
CS Departamento de Patologia, Centro de Ciencias Biologicas, Universidade Federal do Para, Belem, 66075-900, Brazil
SO Infection and Immunity (1997), 65(5), 1606-1614
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology

DT Journal
LA English

L11 ANSWER 55 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 17
AN 1997:696379 CAPLUS
DN 127:330059
TI Immunization against the murine malaria parasite Plasmodium yoelii using a recombinant protein with adjuvants developed for clinical use
AU Ling, I. T.; Ogun, S. A.; Momin, P.; Richards, R. L.; Garcon, N.; Cohen, J.; Ballou, W. R.; Holder, A. A.
CS National Institute for Medical Research, London, NW7 1AA, UK
SO Vaccine (1997), 15(14), 1562-1567
CODEN: VACCDE; ISSN: 0264-410X
PB Elsevier
DT Journal
LA English

L11 ANSWER 56 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:277416 CAPLUS
DN 126:316049
TI Antigenicity of recombinant proteins derived from Plasmodium falciparum merozoite surface protein 1
AU Cavanagh, David R.; McBride, Jana S.
CS Institute Cell Animal Population Biology, Division Biological Sciences, University Edinburgh, Edinburgh, EH9 3JT, UK
SO Molecular and Biochemical Parasitology (1997), 85(2), 197-211
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier
DT Journal
LA English

L11 ANSWER 57 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:536230 CAPLUS
DN 125:192945
TI Immunization of Aotus nancymai with recombinant C terminus of Plasmodium falciparum merozoite surface protein 1 in liposomes and alum adjuvant does not induce protection against a challenge infection
AU Burghaus, Petra A.; Wellde, Bruce T.; Hall, Ted; Richards, Roberta L.; Egan, Andrea F.; Riley, Eleanor M.; Ballou, W. Ripley; Holder, Anthony A.
CS National Inst. Medical Res., Univ. Edinburgh, Edinburgh, UK
SO Infection and Immunity (1996), 64(9), 3614-3619
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English

L11 ANSWER 58 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:391999 CAPLUS
DN 125:55751
TI Natural immune response to the C-terminal 19-kilodalton domain of Plasmodium falciparum merozoite surface protein 1
AU Shi, Ya Ping; Sayed, Umar; Qari, Shoukat H.; Roberts, Jacquelin M.; Udhayakumar, Venkatachalam; Oloo, Aggrey J.; Hawley, William A.; Kaslow, David C.; Nahlen, Bernard L.; Lal, Altaf A.
CS Div. Parasitic Diseases, Center for Disease Control Prevention, Atlanta, GA, 30341, USA
SO Infection and Immunity (1996), 64(7), 2716-2723
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English

L11 ANSWER 59 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1996:759700 CAPLUS
DN 126:30098
TI Reproducing the immune response against the Plasmodium vivax merozoite surface protein 1 with mimotopes selected from a phage-displayed peptide library
AU Demangel, C.; Lafaye, P.; Mazie, J. C.
CS Lab. d'Hybridolab, Inst. Pasteur, Paris, Fr.
SO Molecular Immunology (1996), 33(11/12), 909-916
CODEN: MOIMD5; ISSN: 0161-5890
PB Elsevier
DT Journal
LA English

L11 ANSWER 60 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:103557 CAPLUS
DN 126:183573
TI Sequence studies on the COOH-terminal region of the merozoite surface protein-1 in field samples of Plasmodium falciparum from diverse geographic areas
AU Kang, Yang; Long, Carole A.
CS Dep. Microbiol. Immunol., Medical College of Pennsylvania and Hahnemann University, Philadelphia, PA, 19102, USA
SO Annals of the New York Academy of Sciences (1996), 797(Microbial Pathogenesis and Immune Response II), 282-284
CODEN: ANYAA9; ISSN: 0077-8923
PB New York Academy of Sciences
DT Journal
LA English

L11 ANSWER 61 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:904933 CAPLUS
DN 123:311927
TI Human antibody response to Plasmodium falciparum merozoite surface protein 2 is serogroup specific and predominantly of the immunoglobulin G3 subclass
AU Taylor, Rachel R.; Smith, Donald B.; Robinson, V. Jane; McBride, Jana S.; Riley, Eleanor M.
CS Institute of Cell, Univ. of Edinburgh, Edinburgh, EH9 3JT, UK
SO Infection and Immunity (1995), 63(11), 4382-8
CODEN: INFIBR; ISSN: 0019-9567
PB American Society for Microbiology
DT Journal
LA English

L11 ANSWER 62 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:965199 CAPLUS
DN 124:108069
TI The Plasmodium cynomolgi merozoite surface protein 1 C-terminal sequence and its homologies with other Plasmodium species
AU Longacre, Shirley
CS Unite d'Immunoparasitologie, CNRS URA 1960, Institut Pasteur, Paris, Fr.
SO Molecular and Biochemical Parasitology (1995), 74(1), 105-11
CODEN: MBIPDP; ISSN: 0166-6851
PB Elsevier
DT Journal
LA English

L11 ANSWER 63 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:320885 CAPLUS
DN 120:320885
TI A novel strategy for the synthesis of the cysteine-rich protective antigen of the malaria merozoite surface protein (MSP-1): knowledge-based strategy for disulfide formation

AU Spetzler, Jane C.; Rao, Chang; Tam, James P.
CS Med. Cent., Vanderbilt Univ., Nashville, TN, USA
SO International Journal of Peptide & Protein Research (1994), 43(4), 351-8
CODEN: IJPPC3; ISSN: 0367-8377
DT Journal
LA English

L11 ANSWER 64 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:189193 CAPLUS
DN 120:189193
TI Expression and antigenicity of Plasmodium falciparum major merozoite surface protein (MSP119) variants secreted from Saccharomyces cerevisiae
AU Kaslow, David C.; Hui, George; Kumar, Snajai
CS Mol. Vaccine Sect., Inst. Allergy Infect. Dis., Bethesda, MD, 20892, USA
SO Molecular and Biochemical Parasitology (1994), 63(2), 283-9
CODEN: MBIPDP; ISSN: 0166-6851
DT Journal
LA English

L11 ANSWER 65 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:319008 CAPLUS
DN 120:319008
TI Expression of the 19-kilodalton carboxy-terminal fragment of the Plasmodium falciparum merozoite surface protein-1 in Escherichia coli as a correctly folded protein
AU Burghaus, Petra A.; Holder, Anthony A.
CS Div. Parasitol., Natl. Inst. Med. Res., London, UK
SO Molecular and Biochemical Parasitology (1994), 64(1), 165-9
CODEN: MBIPDP; ISSN: 0166-6851
DT Journal
LA English

L11 ANSWER 66 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:296236 CAPLUS
DN 120:296236
TI Immunization against malaria with a recombinant protein
AU Ling, I.T.; Ogun, S.A.; Holder, A.A.
CS Div. Parasitol., Natl. Inst. Med. Res., London, NW7 1AA, UK
SO Parasite Immunology (1994), 16(2), 63-7
CODEN: PAIMD8; ISSN: 0141-9838
DT Journal
LA English

L11 ANSWER 67 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1993:623738 CAPLUS
DN 119:223738
TI Immunological cross-reactivity of the C-terminal 42-kilodalton fragment of Plasmodium falciparum merozoite surface protein 1 expressed in baculovirus
AU Hui, George S. N.; Hashiro, Carole; Nikaido, Caryn; Case, Stephen E.; Hashimoto, Ann; Gibson, Helen; Barr, Philip J.; Chang, Sandra P.
CS Dep. Trop. Med., Univ. Hawaii, Honolulu, HI, 96816, USA
SO Infection and Immunity (1993), 61(8), 3403-11
CODEN: INFIBR; ISSN: 0019-9567
DT Journal
LA English

L11 ANSWER 68 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 18
AN 1993:557824 CAPLUS
DN 119:157824
TI A recombinant 15-kilodalton carboxyl-terminal fragment of Plasmodium yoelii yoelii 17XL merozoite surface protein 1 induces a protective immune response in mice
AU Daly, Thomas M.; Long, Carole A.

CS Dep. Microbiol. Immunol., Hahnemann Univ., Philadelphia, PA, 19102, USA
SO Infection and Immunity (1993), 61(6), 2462-7
CODEN: INFIBR; ISSN: 0019-9567
DT Journal
LA English

L11 ANSWER 69 OF 99 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1993:469957 CAPLUS
DN 119:69957
TI Analysis of sequence diversity in the Plasmodium falciparum merozoite surface protein-1 (MSP-1)
AU Miller, Louis H.; Roberts, Theodore; Shahabuddin, Mohammed; McCutchan, Thomas F.
CS Lab. Malaria Res., Natl. Inst. Allergy and Infect. Dis., Bethesda, MD, USA
SO Molecular and Biochemical Parasitology (1993), 59(1), 1-14
CODEN: MBIPDP; ISSN: 0166-6851
DT Journal
LA English

L11 ANSWER 70 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70939 Peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-2 N-terminus.

L11 ANSWER 71 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70938 Peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
CR N-PSDB: ABS55097
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1His C-terminus.

L11 ANSWER 72 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70937 Peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201

DT Patent
LA Chinese
OS 2002-723317 [78]
CR N-PSDB: ABS55095
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1 N-terminus.

L11 ANSWER 73 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70936 peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein peptide linker #3.

L11 ANSWER 74 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70935 peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein peptide linker #2.

L11 ANSWER 75 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70934 peptide DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein peptide linker #1.

L11 ANSWER 76 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70933 protein DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p

AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-2.

L11 ANSWER 77 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70932 protein DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-2His.

L11 ANSWER 78 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABG70931 protein DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1.

L11 ANSWER 79 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAB37612 protein DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
DESC Human EGF.

L11 ANSWER 80 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAB37611 protein DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.

PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
DESC Merozoite surface protein-1.

L11 ANSWER 81 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAB37610 Protein DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
CR N-PSDB: AAC68978
DESC Merozoite surface protein-133.

L11 ANSWER 82 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAB37609 Protein DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
CR N-PSDB: AAC68977
DESC Merozoite surface protein-119.

L11 ANSWER 83 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAB37608 protein DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
DESC Merozoite surface protein-1.

L11 ANSWER 84 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAW22592 Protein DGENE
TI Recombinant protein containing **Plasmodium merozoite surface protein**-1 p42 fragment - useful in antimalarial **vaccines**, also new antibodies for diagnosis and protein purification
IN Barnwell J W; Longacre-Andre S; Mendis K; Nato F; Roth C
PA (INSP) INST PASTEUR.
(UYNY) UNIV NEW YORK STATE.
PI WO 9730159 A2 19970821 85p
AI WO 1997-FR291 19970214
PRAI FR 1996-1821 19960214
DT Patent
LA French
OS 1997-425034 [39]
CR P-PSDB: AAW22592
DESC PfMSP1(p19)A protein sequence.

L11 ANSWER 85 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAW22593 Protein DGENE
TI Recombinant protein containing **Plasmodium merozoite surface protein**-1 p42 fragment - useful in antimalarial **vaccines**, also new antibodies for diagnosis and protein purification
IN Barnwell J W; Longacre-Andre S; Mendis K; Nato F; Roth C
PA (INSP) INST PASTEUR.
(UYNY) UNIV NEW YORK STATE.
PI WO 9730159 A2 19970821 85p
AI WO 1997-FR291 19970214
PRAI FR 1996-1821 19960214
DT Patent
LA French
OS 1997-425034 [39]
CR P-PSDB: AAW22592
DESC PfMSP1(p19)S protein sequence.

L11 ANSWER 86 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55098 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
CR P-PSDB: ABG70939
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-2 N-terminus DNA.

L11 ANSWER 87 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55097 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201

PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
CR P-PSDB: ABG70938
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1His C-terminus DNA.

L11 ANSWER 88 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55096 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1 C-terminus DNA.

L11 ANSWER 89 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55095 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
CR P-PSDB: ABG70937
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1 N-terminus DNA.

L11 ANSWER 90 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55094 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-2 associated DNA #1.

L11 ANSWER 91 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55093 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W

PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1 associated DNA #2.

L11 ANSWER 92 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN ABS55092 DNA DGENE
TI Preparation of fusion protein from **Plasmodium merozoite surface protein**-1 and Plasmodium apical membrane antigen-1, for use in anti-malarial **vaccines** for treatment of malaria -
IN Pan W
PA (UYSE-N) UNIV SECOND MILITARY MEDICAL.
PI WO 2002072625 A1 20020919 39p
AI WO 2002-CN49 20020201
PRAI CN 2001-105292 20010201
DT Patent
LA Chinese
OS 2002-723317 [78]
DESC Plasmodium AMA-1/MSP-1 fusion protein PfCP-1 associated DNA #1.

L11 ANSWER 93 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAC68978 DNA DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
CR P-PSDB: AAB37610
DESC Merozoite surface protein-133 coding sequence.

L11 ANSWER 94 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAC68977 DNA DGENE
TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
CR P-PSDB: AAB37609
DESC Merozoite surface protein-119 coding sequence.

L11 ANSWER 95 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAC68976 DNA DGENE

TI Novel variants of the C-terminal fragment of **Plasmodium merozoite surface protein**-1, useful as **vaccines** for treating or preventing malaria -
IN Holder A; Birdsall B; Feeney J; Morgan W; Syed S; Uthaipibull C
PA (MEDI-N) MEDICAL RES COUNCIL.
PI WO 2000063245 A2 20001026 126p
AI WO 2000-GB1558 20000420
PRAI GB 1999-9072 19990420
US 1999-311817 19990513
CA 1999-2271451 19990525
DT Patent
LA English
OS 2001-015762 [02]
DESC Merozoite surface protein-142 coding sequence.

L11 ANSWER 96 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAT80404 DNA DGENE
TI Recombinant protein containing **Plasmodium merozoite surface protein**-1 p42 fragment - useful in antimalarial **vaccines**, also new antibodies for diagnosis and protein purification
IN Longacreandre S; Roth C; Nato F; Barnwell J W; Mendis K
PA (INSP) INST PASTEUR.
(UYNY) UNIV NEW YORK STATE.
PI WO 9730159 A2 19970821 85p
AI WO 1997-FR291 19970214
PRAI FR 1996-1821 19960214
DT Patent
LA French
OS 1997-425034 [39]
CR P-PSDB: AAW22592
DESC PfMSP1(p19)S coding sequence.

L11 ANSWER 97 OF 99 DGENE COPYRIGHT 2003 THOMSON DERWENT on STN
AN AAT80403 DNA DGENE
TI Recombinant protein containing **Plasmodium merozoite surface protein**-1 p42 fragment - useful in antimalarial **vaccines**, also new antibodies for diagnosis and protein purification
IN Longacreandre S; Roth C; Nato F; Barnwell J W; Mendis K
PA (INSP) INST PASTEUR.
(UYNY) UNIV NEW YORK STATE.
PI WO 9730159 A2 19970821 79p
AI WO 1997-FR291 19970214
PRAI FR 1996-1821 19960214
DT Patent
LA French
OS 1997-425034 [39]
CR P-PSDB: AAW22592
DESC PfMSP1(p19)A coding sequence.

L11 ANSWER 98 OF 99 DRUGUPDATES COPYRIGHT 2003 IMSWORLD on STN

ACCESSION NUMBER: 2002:32 DRUGUPDATES
SOURCE: R&D Focus, (14 Jan 2002)
GENERIC NAME: **vaccine, MSP-5; vaccine, merozoite surface protein 5; vaccine, malaria, Progen**
STRUCTURE:
STRUCTURE DIAGRAM IS NOT AVAILABLE
CLASSIFICATION: **J7A9 Other Unspecified Vaccines**
HIGHEST DEV. PHASE: Preclinical (20)

COMPANY INFORMATION:

Type	Company	Nationality
Originator	Progen	Australia

L11 ANSWER 99 OF 99 DRUGUPDATES COPYRIGHT 2003 IMSWORLD on STN

ACCESSION NUMBER: 2002:31 DRUGUPDATES
SOURCE: R&D Focus, (14 Jan 2002)
GENERIC NAME: **vaccine, MSP-4; vaccine, merozoite surface protein 4; vaccine, malaria, Progen**
STRUCTURE:
STRUCTURE DIAGRAM IS NOT AVAILABLE
CLASSIFICATION: **J7A9 Other Unspecified Vaccines**
HIGHEST DEV. PHASE: Preclinical (20)

COMPANY INFORMATION:

Type	Company	Nationality
Originator	Progen	Australia

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LOGOFF? (Y)/N/HOLD:y
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Adams

From: Baskar, Padmavathi
Sent: Monday, August 25, 2003 11:02 AM
To: STIC-ILL
Subject: 10057532

kindly provide the following articles. Thank u.

part 1

1. Assessment of the role of the humoral response to Plasmodium falciparum MSP2 compared protecting Papua New Guinean children from clinical malaria.
AU al-Yaman F; Genton B; Anders R; Taraika J; Ginny M; Mellor S; Alpers M P
CS Papua New Guinea Institute of Medical Research, Madang, Papua New Guinea.
SO PARASITE IMMUNOLOGY, (1995 Sep) 17 (9) 493-501.

2 Effect of context and adjuvant on the immunogenicity of recombinant proteins and peptide conjugates derived from the polymorphic malarial surface antigen MSA2.
AU Jones G L; Spencer L; Lord R; Saul A J
CS University of New England, Armidale, NSW, Australia.
SO VACCINE, (1996 Jan) 14 (1) 77-84.

3 Temporal variation of the merozoite surface protein-2 gene of Plasmodium falciparum.
AU Eisen D; Billman-Jacobe H; Marshall V F; Fryauff D; Coppel R L
CS Department of Microbiology, Monash University, Clayton, Victoria, Australia.
SO INFECTION AND IMMUNITY, (1998 Jan) 66 (1) 239-46.

4. Heritability and segregation analysis of immune responses to specific malaria antigens in Papua New Guinea.
AU Stirnadel H A; Beck H P; Alpers M P; Smith T A
CS Department of Public Health and Epidemiology, Swiss Tropical Institute, Basel.. stirnadel@ubaclu.unibas.ch
SO GENETIC EPIDEMIOLOGY, (1999) 17 (1) 16-34.

5. Human antibodies to the 19kDa C-terminal fragment of Plasmodium falciparum merozoite surface protein 1 inhibit parasite growth in vitro.
AU Egan A F; Burghaus P; Druilhe P; Holder A A; Riley E M
CS Institute of Cell, Animal and Population Biology, University of Edinburgh, Scotland, UK.
SO PARASITE IMMUNOLOGY, (1999 Mar) 21 (3) 133-9

6. Antibodies to a merozoite surface protein promote multiple invasion of red blood cells by malaria parasites.
AU Ramasamy R; Yasawardena S; Kanagaratnam R; Buratti E; Baralle F E; Ramasamy M S
CS Molecular Biology and Immunology Laboratories, Division of Life Sciences, Institute Fundamental Studies, Kandy, Sri Lanka.
SO PARASITE IMMUNOLOGY, (1999 Aug) 21 (8) 397-407.

7. Phase I trial of two recombinant vaccines containing the 19kd carboxy terminal fragment of Plasmodium falciparum merozoite surface protein 1 (msp -1(19)) and T helper epitopes of tetanus toxoid.
AU Keitel W A; Kester K E; Atmar R L; White A C; Bond N H; Holland C A; Krzych U; Palmer D R; Egan A; Diggs C; Ballou W R; Hall B F; Kaslow D
CS Department of Microbiology & Immunology, Baylor College of Medicine, One Baylor Plaza, Houston, TX 77030, USA.. wkeitel@bcm.tmc.edu
NC NO1-AI-25135 (NIAID)
SO VACCINE, (1999 Oct 14) 18 (5-6) 531-9.

8. Surprisingly little polymorphism in the merozoite-surface-protein-2 (MSP-2) gene of Indian Plasmodium falciparum.
AU Bhattacharya P R; Kumar M; Das R H
CS Malaria Research Centre, Delhi, India.
SO ANNALS OF TROPICAL MEDICINE AND PARASITOLOGY, (1999 Sep) 93 (6) 561-4.

9. A DNA vaccine encoding the 42 kDa C-terminus of merozoite surface protein 1 of Plasmodium falciparum induces antibody, interferon-gamma and cytotoxic T cell responses in rhesus monkeys: immuno-stimulatory effects of granulocyte macrophage-colony stimulating factor.
AU Kumar Sanjai; Villinger Francois; Oakley Miranda; Aguiar Joao C; Jones Trevor R; Hedstrom Richard C; Gowda Kalpana; Chute John; Stowers Anthony; Kaslow David C; Thomas Elaine K; Tine John; Klinman Dennis; Hoffman Stephen L; Weiss Walter W
CS Malaria Program, Naval Medical Research Center, Silver Spring, MD 20910, USA.. kumars@nmrc.navy.mil
SO IMMUNOLOGY LETTERS, (2002 Apr 1) 81 (1) 13-24.

10. Synthesis and expression of 42 kD C-terminal region of the major merozoite surface protein (MSP1 - 42) of P. falciparum 3D7 strain in pichia pastoris.
AU Zhang Dongmei; Pan Weiqing; Lu Deru; Jiang Liping
CS Institute of Medical Biotechnology & Molecular Genetics of Second Military Medical University, Shanghai 200433 China.
SO CHUNG-HUA I HSUEH TSA CHIH [CHINESE MEDICAL JOURNAL], (2002 Feb 10) 82 (3) 198-202.

11. A recombinant blood-stage malaria vaccine reduces Plasmodium falciparum density and exerts selective pressure on parasite populations in a phase 1-2b trial in Papua New Guinea.
AU Genton Blaise; Betuela Inoni; Felger Ingrid; Al-Yaman Fadwa; Anders Robin F; Saul Allan; Rare Lawrence; Baisor Moses; Lorry Kerry; Brown Graham V; Pye David; Irving David O; Smith Thomas A; Beck Hans-Peter; Alpers Michael P
CS Papua New Guinea Institute of Medical Research, Maprik, Papua New Guinea.. Blaise.genton@hospvd.ch
SO JOURNAL OF INFECTIOUS DISEASES, (2002 Mar 15) 185 (6) 820-7.

12. Development and pre-clinical analysis of a Plasmodium falciparum Merozoite Surface Protein -1(42) malaria vaccine.
AU Angov Evelina; Aufiero Barbara M; Turgeon Ann Marie; Van Handenhove Michel; Ockenhouse Christian F; Kester Kent E; Walsh Douglas S; McBride Jana S; Dubois Marie-Claude; Cohen Joe; Haynes J David; Eckels Kenneth H; Heppner D Gray; Ballou W Ripley; Diggs Carter L; Lyon Jeffrey A
CS Department of Immunology, WRAIR, 503 Robert Grant Avenue, Silver Spring, MD 20910, USA.. Evelina.Angov@na.amedd.army.mil
SO MOLECULAR AND BIOCHEMICAL PARASITOLOGY, (2003 May) 128 (2) 195-204.

13. the merozoite surface protein 1 complex of human malaria parasite Plasmodium falciparum: interactions and arrangements of subunits.
AU Kauth Christian W; Epp Christian; Bujard Hermann; Lutz Rolf
CS Zentrum fur Molekulare Biologie der Universitat Heidelberg, Im Neuenheimer Feld 282, D-69120 Heidelberg, Germany.
SO JOURNAL OF BIOLOGICAL CHEMISTRY, (2003 Jun 20) 278 (25) 22257-64.

----------**Part2**

14. Safety and immunogenicity of a three-component blood-stage malaria vaccine in adults living in an endemic area of Papua New Guinea.
AU Genton B; Al-Yaman F; Anders R; Saul A; Brown G; Pye D; Irving D O; Briggs W R; Mai A; Ginny M; Adiguma T; Rare L; Giddy A; Reber-Liske R; Stuerchler D; Alpers M P
CS Papua New Guinea Institute of Medical Research, Goroka and Maprik, Papua New Guinea.. blaise.genton@chuv.hospvd.ch
SO **VACCINE, (2000 May 22) 18 (23) 2504-11.**

P. Baskar
RA/1645
10057532
8/25
QR1.A47 A35

15. TI Synthetic low-toxicity muramyl dipeptide and monophosphoryl lipid A replace Freund complete adjuvant in inducing growth-inhibitory antibodies to the Plasmodium falciparum major merozoite19. TI Malaria vaccines.
AU Romero P
CS Ludwig Institute for Cancer Research, Lausanne, Switzerland.
SO CURRENT OPINION IN IMMUNOLOGY, (1992 Aug) 4 (4) 432-41. Ref: 92

surface protein, gp195.
AU Hui G S; Tam L Q; Chang S P; Case S E; Hashiro C; Siddiqui W A; Shiba T; Kusumoto S; Kotani S
CS Department of Tropical Medicine, School of Medicine, University of Hawaii, Honolulu 96816.
SO INFECTION AND IMMUNITY, (1991 May) 59 (5) 1585-91.

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